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(Gelatine Print issued only with Imperial Edition.)
Competitive Design for the World Building, New York.
House at Los Angeles, Cal.
The Place of Arms, Santiago, Chili.

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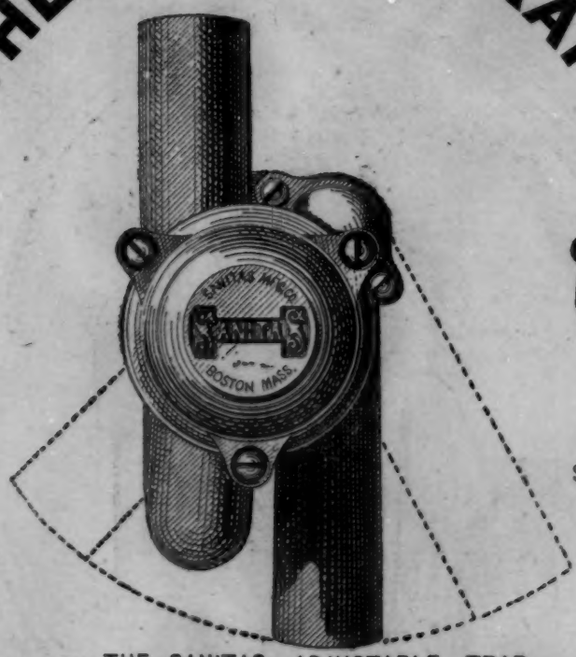

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THE history of the competition for the extension of the Boston State-House, which has now apparently closed, is a curious one. According to the Boston newspapers, the reason why the Commissioners who had the matter in charge allotted seven weeks for making designs for a building to cost perhaps two million dollars was that the Governor, who was one of the Commissioners, was ill for several months, so that the commencement of the affair was put off until his recovery, while its conclusion was fixed by the Legislature at a date which could not be changed without new legislative action. When a large number of the best-known architects of the State united in protesting against the shortness of the time, as well as the other objectionable conditions of a programme which fell very far short of the standard acceptable to the profession, the Commissioners frankly acknowledged that there was some reason for the protest, and informally supported a resolution, which passed unanimously through the committee stage in the Legislature, to the effect that the time for submitting drawings should be extended to the end of March; that a larger sum should be awarded in money-premiums; that the execution of the work should be promised to the author of the best design, and that expert assistance should be employed in making the awards. The Commissioners evidently supposed that the resolution would be adopted by the Legislature without hesitation, and sent out circulars to architects, giving the text of the pending resolution, and extending the time meanwhile, on their own responsibility, to the twenty-eighth of January, the latest date that they could set under the authority given them by the statute under which they acted. When the new resolution was reported from the committee to the House of Representatives for action, the sentiment of the members is said to have been so generally favorable to it that there appeared to be no doubt of its immediate passage until a member rose and explained that, even if they passed it, they would still be legally bound to pay the premiums that had been promised to plans submitted in January, as, if any one chose to comply with the terms already announced, he would have an implied contract with the State, and could require the State to fulfil its part of the contract and award the premiums in conformity with the stipulations first published. It is hardly likely that a competitor who thought his design was good for anything would, if it happened to be ready in January, go to law to compel the State to take it then, and pay a small money-prize for it, instead of keeping it two months and then presenting it, with the chance of securing either the execution of the work or a money-prize twice as large as the old conditions promised, but there was certainly a chance that some trickster, after the field had been temporarily cleared of the respectable architects by the extension of the time and the remodelling of the programme, might present an apology for a sketch, and demand the stakes that the State had incautiously pledged.

THE chance of this catastrophe, by which the State might possibly have to pay out thirty-five hundred dollars in prizes for worthless designs, besides what it would have to pay later for properly studied ones, would not greatly alarm a private person, who would consider a sacrifice of one-fifth or one-sixth of one per cent on the cost of a proposed building not too great a price to pay for the privilege of cancelling hasty and injudicious engagements, and setting himself free to conclude more satisfactory arrangements for the administration of his investment; but it frightened the legislators, who decided that their thirty-five hundred dollars must be saved at all hazards, and rejected the resolution. The Commissioners, with consistent courtesy, immediately sent out another circular to architects, informing them of the action of the Legislature, and pointing out that under the circumstances nothing was left to those who wished to compete but to hand in their drawings on or before January 28. When that day arrived, ten designs were found to have been submitted. Two accomplished architects, one of whom had already studied the problem thoroughly as professional adviser to the Legislative Committee on the State-House, while the negotiations for the site were in progress, were called in as experts, and an award made and reported to the Legislature on the appointed day. By this award, the first premium, of fifteen hundred dollars, was awarded to Messrs. Brigham & Spofford; the second, of twelve hundred dollars, to Mr. John Lyman Faxon; and the third, of nine hundred dollars, to Mr. H. S. McKay, all of Boston; and Messrs. Brigham & Spofford's plan was, in the report of the Commissioners, recommended for adoption, with modifications. We sincerely hope that this may be the end of the matter, and that the design will be carried out by its authors with satisfaction to all concerned. In justice to their design, it should be mentioned that they were employed by the State, some time ago, to make complete measured drawings of the present State-House, and of the plans and levels of the site for the extension. In doing this work, which was admirably executed, it would have been strange if the knowledge of the conditions so gained had not shaped itself, as their work proceeded, into some idea of the best plan for satisfying them, so that their design may fairly be regarded as having had, perhaps, several months of study before the other architects knew anything about the matter. Possessing this advantage, it may have been fortunate for them that the decision was made before the other architects who chose to compete had had time to make a similar study of the problem, and we need hardly point out how fortunate it certainly was for the great majority of the Massachusetts architects that they withdrew in time from a contest which, as it turns out, would have been so unequal, even if it had been unexceptionable in other respects.

A CASE involving a principle of great importance to architects was recently decided in the Court of Common Pleas in New York. A well-known architect, Mr. Hubert, brought suit to recover the value of his services from a client for whom he had built an apartment-house. The client, Mr. Aitken, claimed an offset of one thousand dollars from the bill, on the ground that "the area of the flue provided in the chimney was inadequate for the service of the boiler, so that the proper consumption of the coal could not be secured," and that he would, in consequence, be obliged to build a new chimney-flue on the outside of the building, the "necessary cost and expense" of which would be a thousand dollars, as claimed. It was proved that the architect asked the contractor for the steam-heating about the size of the flue he needed, and that the flue was built according to his instructions, but the court held that the architect, not the steam-heating contractor, was responsible for the failure of the latter to know his own business, and that the architect must pay the thousand dollars claimed. We presume, from a somewhat extended acquaintance with such cases, that there is not the slightest probability of the new chimney being built, and that the owner, after he gets through chuckling over the ingenious device by which he transferred a thousand dollars from an architect's pocket to his own, will find that the old flue really answers very well, and that it is hardly worth while to annoy his tenants by making any changes, and so on. The fact is, as every architect who has studied the subject knows, that not one flue in five hundred for boilers devoted principally to heating is made of the dimensions required for the "proper," that is, the economical con-

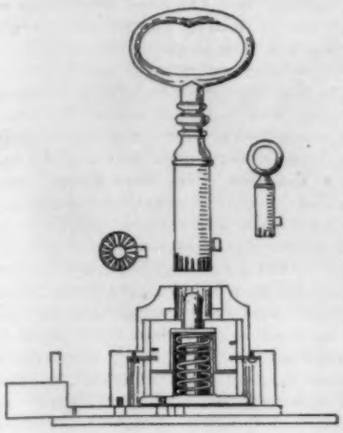
sumption of coal. The obvious reason for this is that, if the dimensions of the flue are calculated by the rules of proportion to grate-surface used in designing the chimneys for power-plants, where economy of coal is of the utmost importance, the owner, when he sees the plans, is horror-stricken at its size. To his mind, it appears to block up most of the rentable portion of his building, and he flies to a steam-heating contractor, who soothingly assures him that a twelve by sixteen flue, or even an eight by twelve, in case of need, will do very well, and, as is probably true, that he has often utilized the latter for boilers where nothing better was to be had. Nothing is said then by either party about the "proper consumption of the coal," and the indignant owner, after relieving his feelings by going about among his friends and denouncing his architect as a "crank on the subject of flues," and warning them to have nothing to do with him, comes back to the office and requests that the matter may be left entirely to the judgment of the heating-contractor, who "guarantees the results." In most cases this ends the matter; the boiler works as well as house-heating boilers generally do, and the owner congratulates himself ever after on his good fortune in having headed off the architect in time to prevent him from spoiling the building with his huge chimney. In the five hundredth instance, perhaps, the owner, aroused, as many persons are, by the presentation of a bill to an inquiry after pretexts for not paying it, bethinks himself of his chimney-flue, and the unfortunate architect then finds that the law, at least in New York, does not allow him "to shelter himself behind the heating-contractor," although it gives the heating-contractor admirable facilities for hiding behind him, and that he must pay not only for a new chimney, but for the consequences of any other error of judgment that the heating-contractor may fall into in regard to his own guaranteed work.

IF this doctrine, as we deduce it from the report which the *Engineering and Building Record* gives of the case, were often acted upon, the practice of architecture would soon be abandoned, and owners and steam-heaters would have to grapple with each other directly, instead of both healing the wounds that each chose to fancy the other had inflicted by helping themselves to balm out of the common reservoir, the architect's pocket; but even the possibility that an occasional individual may try to take advantage of it acts as a continual menace to the profession. We shall leave comment upon the legal aspects of the case to other hands, but, from the point-of-view of practising architects, we cannot help feeling how serious a misfortune it is that such a case as this could not have been taken up by a powerful protective association and carried, if necessary, to the Supreme Court of the United States, so that the law might be settled, once for all, and the professional conduct of such matters shaped accordingly by unanimous action. As we all know, most steam-heating contracts include a guaranty that the work, if carried out according to the proposal made, shall be efficient and satisfactory. As this guaranty is a serious matter for the contractors, they usually seize any interference or direction of the architect as a pretext for withdrawing it, reserving their right to complete the contract without it. It is needless to say that work done on a heating-contract under guaranty seldom fulfils the guaranty when first completed, and is only brought to conformity with it after several successive struggles, while work done on such a contract after the guaranty had been withdrawn might safely be warranted not to do anything that was required of it; so that architects are very careful to avoid giving any advice or instructions that might be tortured into an interference with the contract. In the light of this decision, however, it appears it is the architect who furnishes the guaranty in all cases, while the steam-heater gets the money. If the architect meddles in any way with the latter's method of carrying out his contract, the guaranty clause of the contract is immediately withdrawn, the work, when completed, proves inefficient, and the owner pays the contractor in full, and requires the architect to put in new heating-apparatus at his own expense as a penalty for interfering with the contractor's operations. If, on the other hand, the architect refrains from giving any directions, so that he may be sure of being able to enforce the guaranty clause of the contract, the owner, if his heart is tender toward steam-heaters, or he gets tired of waiting for the guaranty to be fulfilled, has only to pay the contractor in full and lay hands on the architect, who will be informed by the court that "Responsibility cannot be shifted in that way," and will be compelled, as before, to put in new heating-apparatus at his own expense as a penalty for *not* interfering with the contractor's operations. It may be that this is the law, which, according to the highest authority in England, is quite a different affair from justice, but we are willing to entertain a doubt on the subject.

WHILE we are considering the subject of heating contracts, and the sort of guaranty that the manufacturers of heating apparatus are supposed to give with their goods, we may draw a lesson from a letter addressed to the law editor of *La Construction Moderne*. The writer of the letter, an architect, says that one of his clients, who had just opened an ice-cream saloon in a new building, began to think, on the approach of winter, of means for warming his room. He wrote to an establishment in Paris for suitable apparatus, and the Parisian firm sent a representative, who examined the chimney flue, and, on the arrival of the heating apparatus, set it up, ready for use, and left it. The new owner, however, found, on taking possession of it, that it would not heat the room, and that a fire would hardly burn at all in it. He complained to the Paris manufacturers, who altered and lengthened the chimney, until, as they said, everything was in proper order. The new arrangement proved no better than the old, but it was hardly possible to make any change in the middle of winter, so the proprietor endured the cold, as best he might, until spring. He then went to the manufacturers, and described his condition at length. They offered to take back the original stove, and put in a larger one; and the proprietor agreed to this, but, on returning home, he reflected that the new stove, which would be six feet high, and nearly a yard in diameter, would be anything but an ornament to his room, and he telegraphed back the same day to the manufacturers, declining the proposed arrangement, on the ground that he had concluded to have a furnace put in the cellar by a local contractor. The Paris firm replied, offering to take back the unsatisfactory stove, on condition that they were employed to build the new furnace; but the saloon-keeper thought he had had enough of their goods, and went on with the local furnace-man, who put in a perfectly satisfactory apparatus. Meanwhile, the original stove had been shipped back to the manufacturers, who simply acknowledged the receipt of it, mentioning that they had put it in storage. All this part of the transaction took place in May, and the saloon-keeper, who had paid forty dollars on account for the unsatisfactory stove, probably thought that he had paid dear for a disagreeable experience. Seven months later, however, in December, the Parisian manufacturers sent a demand for the balance of the price of the rejected stove, amounting to forty-four dollars, together with a bill for storage, and another bill for the price of the larger stove which they had agreed to furnish in place of the unsatisfactory one, but which had been countermanded by telegraph, less an allowance for its return.

THE saloon-keeper, who thought in paying half the price of a guaranteed apparatus, which had turned out perfectly useless to him, and had been returned in good order to the makers, to be sold to some one else, he had done all that could be expected of him, applied to his architect for advice in regard to the new demand, and the architect applied to the law-contributor of the journal, M. Ravon, who replies unhesitatingly that the Parisian manufacturers are technically in the right, and that the saloon-keeper will have to pay the bill. In France, as here, although a furnace-maker is presumed to guaranty the proper working of an apparatus which he sets up, he must be allowed all reasonable opportunity for making good his guaranty, and the fact that the apparatus fails to do what it was warranted to do must be clearly established before expert and impartial witnesses. In this case the proprietor had refused to allow the manufacturers to make good the deficiency in their apparatus by substituting another, and he had not called in experts to establish its defects, but had taken the law into his own hands by sending back the stove with nothing but his own assertion that it was useless to him. The manufacturers, on the other hand, had proceeded cautiously and legally. On being notified that the stove was unsatisfactory, they had twice offered to replace it, first by a new stove, and, secondly by allowing its price toward that of a furnace. On the rejection of these offers, and the return of the stove, they had promptly given notice that it was received only as the saloon-keeper's property, to be stored at his expense, and like most people who prefer legality to abstract justice, they had come out of the affair with all the winning cards in their hands.

BUILDERS' HARDWARE.[1]—XVIII.



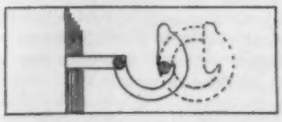


Fig. 291. The Bramah Lock.

IT has not been the intention to consider in detail any articles of hardware which are not in actual daily use at the present time; but there are a few styles of locks which are entirely obsolete so far as the American trade is concerned, but which should be included in any study of the subject, if one wishes to thoroughly understand the principles of modern lock-making, and the processes of elimination and survival of the fittest which have brought the manufacture to its present state in this country.

Figures 291 and 292 illustrate the old "English Bramah" lock. This consists of a revolving cylinder in which is disposed radially a series of flat sliders working up and down through slots in a fixed horizontal plate. The sliders have notches on the outer edges, cut at different heights, so that the cylinder can revolve only when the notches on the sliders are on a line and level with the plate. The sliders are forced outward by a single central coiled spring. The key consists of a tube, on the sides of which are straight grooves corresponding to the desired depression of the slides, with a shoulder to turn the cylinder. The locking-bolt is moved by an eccentric attached to the cylinder. The notches on the sliders are disposed as irregularly as possible, and false notches are added, with corresponding false widenings of slots in the plate. All of the sliders can be pushed in farther than is needed to bring the notches on a line with the plate, so that the lock is picked with great difficulty.

"Cotterill's" lock, Figures 293, 294 and 295, is another example of English ingenuity. The portion which is acted upon by the key consists of a rotating flat disk or cylinder containing ten or more slides moving in radial grooves and pressed

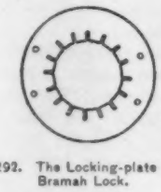


Fig. 292. The Locking-plate of the Bramah Lock.

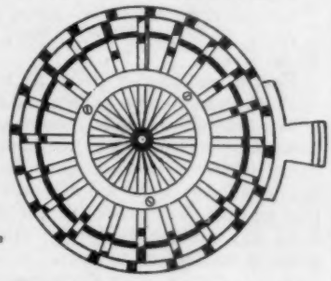


Fig. 293. Plan of Cotterill's Lock.

towards the centre by springs. A fixed ring or plate is fitted to a circular groove on the face of the disk, and has slots corresponding in position to the radial slides. There are also grooves cut on the edge of the slides, so that when the key is in place the slots on the slides coincide with the circular groove on the disk, permitting the whole to be revolved. When the key is withdrawn the slides are forced in different degrees towards the centre, so that the solid portions intercept the groove in the disk, in which position it is held fast by the fixed ring. It is believed that this lock never has been picked.

A lock which in its time was a strong competitor with "Bramah" and "Cotterill's" locks, and was equally impregnable, is "Day and Newells" Parautopic bank-lock, an American invention which was in great demand at one time, but has long since ceased to be manufactured. It has the curious property that the key, which is made with movable bits, can be changed at will, so that the lock can be opened only by the key which was last used to shoot the bolt. The lock has never been picked. Figure 296, which is taken from *Price*, is too complicated to fully illustrate the workings. Figure 296*b*, while not exactly like the lock, embodies the same arrangement and will serve to make the construction understood. The letters refer to both figures. There are three distinct sets of levers, *A*, *B* and *C*, each admitting of a sliding or

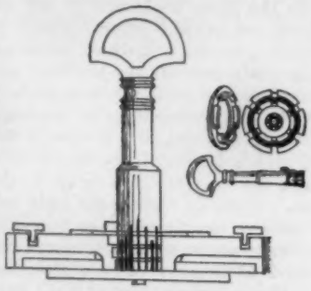


Fig. 294. Section.

Fig. 295. Locking-plate.

lifting motion up and down, the levers *A* having springs which keep them pressed down, *D*, and the levers *C* being constantly forced up by a spring of lesser strength *E*, so that the levers *C* will always move up and down exactly as *A* are raised or lowered, the tops of *C* bearing against the bottom of extensions to *A*. The levers *B* have no springs, and slide up and down between studs attached to a wing of the bolt-tail, so that when the bolt is shot, the levers *B* move with it. *F* is a dog

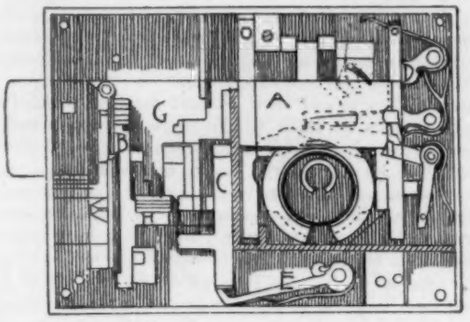


Fig. 296. Parautopic Lock.

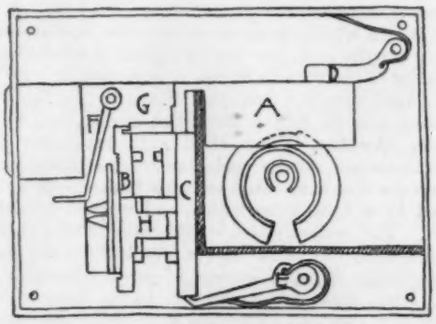


Fig. 296*b*. Parautopic Lock.

or lever, which is hinged to a stud on the bolt at the top, and hinged with a bent elbow attached to the lock-case at the bottom. On this dog, *F*, is a tooth, and on the edge of each of the tumblers *B* are notches corresponding in mutual distance with the difference in lengths of the movable bits of the key. Furthermore, the levers *A* are each made with an arm *G* which fits into a corresponding notch in the levers *B*, and the levers *B* have each an arm *H* which exactly fits between two arms on each of the levers *C*. Figure 296 shows the lock with the bolt thrown, and Figure 296*b*, shows it drawn back. When the key is turned in the lock, the bits, no matter in what order they may be arranged, lift the levers *A*. These, by means of the arms *G* and *H*, lift the other sets of levers in exactly the same proportion. The key then forces out the bolt, and the levers *B* are withdrawn from the arms *G* and *H*, but before the arms *H* are entirely free from the arms on the

[1] Continued from page 54, No. 684.

levers *C*, the notches on *B* are caught on the tooth of the dog *F*, the levers *B* being then held at exactly the relative heights to which they were raised by the action of the key on levers *A*. The key, continuing to turn, then allows levers *A* and *C* to drop to their original position, and the bolt is then locked. It is evident that only the proper key will answer to unlock the combination, as unless the levers *A* and *C* are raised in exactly the proportion they were when the bolt was shot, the arms *H* cannot enter between the arms on levers *C*, and the bolt cannot be moved. There are several other features of the lock, such as detector plates, wards, etc., which need not be noticed here. A circular curtain protects the keyhole, and a solid partition entirely prevents access to the levers, while if any attempt is made to discover the combination by applying pressure to the bolt and tentatively rising the levers *A*, the arms on the levers *B* and *C* which have notches on the ends will catch on each other and be immovable as long as the pressure remains on the bolt. With an eight-lever lock and eight-bitted key, over 5,000 different combinations can be made.

A very ingenious idea which seems not to have survived the the test of years was embodied in another English device — "Parnell's" Defiance lock. The peculiarity here is in the key, which is made with expanding bits. When out of the lock it has the appearance of a key-blank. Eccentrics in the lock force out the proper bits to act on the levers, and the keyhole is guarded in such a manner that a key which could enter and was without expanding bits, would simply turn without affecting the lock; whereas a key with fixed bits which would be right to move the levers could not enter the keyhole.

As previously stated, none of the foregoing are now used in this country, but from them several of our best locks have been derived. Prior to 1851 all of the best locks used here were of English make, but from causes which will be explained in a a subsequent chapter, American locks came to the front about that time, and to-day an English lock would be looked upon as a curiosity in our hardware trade.

Turning then to our own current manufactures, there are several varieties of locks which are commonly found in the market. The "dead-lock" consists simply of a bolt thrown by the action of the key on the levers, but does not include any knob or latch. A "mortise lock" is one which is mortised into the frame of the door, and always includes, as commonly understood, both bolt and latch. A mortise lock is generally operated from either side. A "rim-lock" is one that is planted on the face of the door. It is generally made with a nicer-looking case than the mortise locks, and requires longer keys and a little different adjustment of the knob-spindles. A dead-bolt may be either mortise or rim, but, generally speaking, rim-locks are understood to have both latch and bolt. A "rebated lock" is one which is mortised into the door-frame like an ordinary mortise lock, but the face-plate is rebated so as to fit the rebates of the door to which it is attached. This form of lock is used only for front double-doors. In the East it is customary not to rebate the front doors, but, we believe, generally speaking, in the West such locks are necessary. Special locks are usually made for front and vestibule doors. The lock for the front door includes a dead-bolt and a latch operated by a knob from within, and worked by a key from without. The vestibule lock consists simply of a latch worked by a knob from the inside and a key outside, the same night-key answering for the latches of both front and vestibule doors. Hotel locks are understood to be those which are so arranged that they can be opened from either the inside or the outside, but when locked from the inside cannot be unlocked from the outside. There are many varieties of hotel locks. Generally they are made in sets of fifty, one hundred, two hundred, or more, as desired, and are master-keyed, that is to say, the tumblers are so arranged that one key will unlock the whole series, though the individual keys of the different locks will not unlock each other. Again, they are sometimes made so that the lock can be locked from the inside with one key, and an exactly similar one can unlock it from the outside, but the master-key cannot unlock it after the bolt has been thrown from the inside, and after the bolt has been thrown twice from the inside nothing can open it from the outside. Such locks are intended to be used where two persons room together, but do not come in at the same hour, each wishing to be secure against intrusion, and yet leave the lock so it can be opened by his comrade.

Locks are made both by hand and by machinery. Boston, at present, seems to lead the country in lines of hand-made locks. Indeed, it is doubtful if in any other city such an industry could so long survive the extended application of machinery to labor which has so strongly marked this century. But in Boston the old ideas are slow to go, and the people are loath to give up a thing once tried and proved, merely because there is something else in the market, even though the something else may be cheaper. There is no question but that a hand-made lock, if the manufacturer is thoroughly conscientious, is better than one made by machinery, especially as the hand-made lock manufacturers, thus far, never have catered to a cheap trade, and have always kept their goods up to the very highest mark. In the hand-made locks the levers are carefully adjusted, nearly all the interior fittings are made of brass, and, while in some respects hand goods may be inferior in fineness of polish and smoothness of exterior appearance, no one ever denies their excellence. But, on the other hand, the cost of hand-made goods is so much higher than those made by machinery that the former are gradually being driven out of the market, especially since some of the best of the machine-lock manufacturers have succeeded in turning out such admirable goods. To the uninitiated the best of the machine-made locks are quite as good as any that are turned out by hand, while the progress of machinery has been so great that it is possible to obtain almost any desired accuracy of adjustment. Of course, the best of locks, even those which are nominally machine-made are fitted by hand. Only in the cheapest forms are locks left as they come from the machine.

In regard to price, machine-made locks may be divided generally into six classes. This division, of course, is not absolute. Locks are made in all grades, and are of all prices. Some very good locks are made in cheap form, and some very poorly designed locks are listed at a high price; but for general comparison this division will be satisfactory:—

First, the cheapest form of lock made, with iron face and bolts, steel spring, and a single lever: P. & F. Corbin have a lock of this description which sells in the market for a $1.50 a dozen.

Second, a lock with brass face and bolts, all the rest of the construction iron, one lever; average price $4.00 to $4.50 a dozen.

Third, brass face and bolts, all the rest iron, with two levers; $7.00, or with three levers $8.00 per dozen.

Fourth, anti-friction latch, brass face and bolts, three levers, $17.00 per dozen.

Fifth, front door lock and latch, $1.50 to $4.50 each.

Sixth, hotel locks, $2.50 to $5.00 each.

Hand-made locks may be divided according to cost into five classes:—

First, single lever with brass face and bolts, $1.50 each.

Second, three levers, brass face and bolts, $2.50 each.

Third, anti-friction strike, three levers, brass face and bolts, $3.00 each.

Fourth, anti-friction strike, all brass-work, $5.00 each.

Fifth, front door locks from $8.00 up.

The foregoing classification of machine and hand-made locks according to price does not imply two classes in regard to either efficiency in working or nicety of plan. The machine and hand-made locks are designed on exactly the same principles, and the differences are but slight. Still the hand-made locks are, throughout, better than a relatively corresponding grade of machine-made locks.

[To be continued.]

Duty Paid on a Pharaoh. — An absurd instance of the length to which the policy of protection is carried out by French *douaniers* was told the other day by M. Maspéro to some friends. He had brought back from Egypt a royal mummy. Of course the case had to be opened at Marseilles. Being told it contained a Pharaoh, the officer looked up "Pharaoh" in the tariff; but, as it was not to be found, he decided that Pharaohs, being an article of which there was no mention, should be taxed according to the highest scale. So M. Maspéro was made to pay as for dried fish. For years an English mustard had been imported and the ordinary duty on mustard charged. However, the French customs one day decided that the mustard contained flour and should be charged a higher duty. On a further analysis a homœopathic quantity of an ingredient not in the tariff was found, and so the mustard was held to fall under the heading of unspecified spices," and accordingly a duty of 24*s.* a hundredweight is now payable on thirty-shilling mustard. Pickles are called in the French tariff "conserves au vinaigre." Last year, however, it was discovered that pickles mostly contained ginger or cloves or cayenne paper, and pickles were forthwith subjected to an extra duty. — *London Daily News.*

AUGUSTE RODIN, SCULPTOR.[1] — III.

"Ugolin." A. Rodin, Sculptor.

FREE once more from the repulsive relationship of ignorant and troublesome employers, in firm possession of that insight which directed him to the simplest and purest expression of sculpture, and a facility of hand that made the clay an unobstructive obstacle, Rodin started upon the execution of the statue that was eventually to place him among the greatest sculptors of his country.

But the sailor at Antwerp lay uneasy on his mind. The studies of the past eighteen years were demanding some definite order and classification, some tangible point of departure. The visions of the compositions of the Renaissance Colossus, had a nearer and more forcible effect, and Rodin set out for Italy to study them in their original surroundings.

Of this journey, he says: "In looking at the Medici tombs I was more profoundly impressed than with anything I have ever seen. I mean as a matter of impression, simply. For Michael Angelo, great as he is, is weak in modelling in comparison with the antique. I like his works because they are living and I could find in them what I wanted. After looking at these figures long and well, I returned to my room at the hotel and began making sketches, to test the depth of my own capacity of composition and of the impressions I had received; and I found that I could do nothing like my sailor, unless I copied Michael Angelo. I made no end of sketches, always with the same result. During my journey to Rome, Naples, Sienna and Venice, I continued drawing, in the hope of discovering the principles upon which the compositions of Michael Angelo's figures were founded. I was, at the same time, struck with the idea that these principles were not original with him, but the result of discoveries made by those who had preceded him. I also had my doubts about his being conscious of these principles, or that he was the consummate artist and man that many think he is. He seems to me to have worked little from nature; that he had one figure, or type, that he reproduced everywhere and constantly, and that he took entire figures from Donatello, besides using a certain movement of the wrist and foot, common to the latter. I think Michael Angelo simply completed, in movement and general scheme, the figures whose natural principles of composition were discovered by those who went before him." Rodin returned to Brussels and continued his investigations of the principles of composition upon which Michael Angelo's figures are founded. At last, he solved the problem, and the mystery became clear. With its solution also came the key of the principles inherent in his own nature, and by which he has been guided in all of his subsequent works. He does not feel certain that he would have found them had he not first studied Michael Angelo and discovered the principles by which he was guided. Of them all, he says: "They are found in nature, or she verifies them, if you look carefully enough. They are so simple, that they can be taught in six months to any student of average intelligence, so that he can exemplify them, as facts, almost as well as I can myself. In a word, Nature tells the whole story." The work on "The Age of Brass," also went on, and for eighteen months the sculptor gave it his best efforts, never for a moment feeling that he should arrive at any satisfactory result. "I was in the deepest despair with that figure," he observes, "and I worked so intensely on it, trying to get what I wanted, that there are at least four figures in it." When it was completed he exhibited it in January, 1877, in the Circle Artistique, in Brussels, where it was generally received with derision, pronounced a reproduction from moulds made on the living model, and criticised because it did not stand well.

But a writer on one of the city papers, *L'Echo du Parlement*, recognized its surprising qualities, and spoke of them with deserved words of praise. "The statue," he says, "has made a sensation *among* artists, and will, no doubt, attract much attention in the Paris *Salon*. Wholly taken up as the artist has been — and as every true artist is who makes his art his chief aim — with the question of style and execution, he has only forgotten one thing, and that is to explain his subject. This lack has awakened much criticism, and caused many questions to be asked. Why are the eyes half closed, and that hand lifted up? Is it the statue of a somnambulist? But let us be reassured; all is clearly and logically explained by this title, 'The Vanquisher,' and it suffices to add that the raised hand ought to hold two spears. From a pure art point-of-view, the work is very beautiful, and, above all, very original. It is realism — that which proceeds directly from the Greeks; it is their modelling, in large planes, their accentuation, sober and firm, their learned anatomy but profoundly living, indicated as it is in nature, with movements that change and are sometimes hidden; anatomy studied in the exercises of the gymnasium, and not, like that of the Florentines of the sixteenth century, from a skinned anatomical figure. This realism is not only a striking truth, it is, at the same time, a great selection and a grand style. If M. Rodin ever had a master, he was certainly not one of the realists of these days, who confine themselves so often to servile copying of plaster casts. The statue is inspired by the powerful metopes of the Parthenon, or the supple and robust Illyssus, by Alcamene."

Among the large studies made by the sculptor in Brussels, in the development of his principles of composition, was a group called "Ugolin," but he was not satisfied with it, and destroyed all save the body of the principal figure. This is one of the best examples of his large style of modelling. He also found time, before he began "The Age of Brass," to make a number of heads and figures in terra-cotta, which he could not sell in Brussels, but which were bought by a Mr. Gammon, an English art-buyer, who afterwards sold them at Albert Hall in London. Rodin did not set any artistic value upon these things, but Dalou, an eminent French sculptor, who saw them in London, affirms that they possessed great merit.

Rodin had one, not very satisfactory, transaction with the Anonyme des Bronzes Company. He sold them a very beautiful marble bust which he called "La Petite Manon," for the small price of one hundred dollars. The company, appreciating the commercial value of the work, bought of the sculptor for twenty dollars more the right to reproduce it in bronze. Thinking they had a mine in Rodin which they could work for their exclusive profit, they wished to buy more of his things, but his suspicions were aroused at their readiness to purchase at a low price, and feeling that they had taken advantage of him in the first transaction, he would not let them have anything else.

To a considerable extent Rodin's professional life in Belgium had been satisfactory. For the first time he had been his own master, and engaged upon work that suited his temperament, large compositions of many figures. From first to last he had had his own way. With his genius it was a sublime obstinacy — the obstinacy of all great men. In six years his eyes had become open to the art around him, and he saw it from a different point-of-view. "Up to 1871," he remarks, "I lived in the old idea that sculpture was making progress in France. But it was not true. I had changed during my life in Belgium, and when I came back to Paris my idols had fallen in the dust. I saw that we had no successors to Puget, and that we were really going down hill. The statues that I adored before I went away, I could not bear after I had returned. I do not like sculpture made from plaster casts, it has no life." It is difficult to measure, with any degree of exactness, the amount or character of Rodin's progress while in Belgium. The work he did for public buildings, except in the matter of composition, would hardly be a fair test, and we must rely upon "The Age of Brass" as the consummated result, or, rather the best outcome of what he did in Belgium, at least so far as modelling goes. The result of his study of the principles of figure composition showed itself later on.

"The Broken Nose," made, it will be remembered, when he was about twenty-two years of age, remains the tremendous witness of the power of his earlier efforts, and his own judgment in regard to the merits of the many figures he had executed in the following ten years, some of which he feels sure were as good as "The Age of Brass," must stand good. This being true, his progress was on the side of deeper insight into the subtile secrets of composition, the more exact formulation of his own temperament, greater familiarity with, and better judgment of, fine works of art, and a more correct observation of nature. His own world of art had begun to take in the world around him.

Rodin's individual life in Belgium had been so much more agreeable than it was in Paris, that both himself and Mme. Rodin look back upon it as "the most beautiful and happy days of our lives." In Brussels, they lived in Rue Bourgeneist, quite on the outskirts of the city, practically in the country. They occupied one room, hired of a florist, whose gardens surrounded them, for which they paid twenty-two dollars a year rent. With it they had a garden, twice the size of their room, which contained one tree — a forest to them — and under which in summer they ate their meals, drank French wine, reposed themselves and rejoiced in sylvan happiness. For company, they had a dog, a goat, a cat and some rabbits. Mme. Rodin cultivated her plants and flowers, while her husband lay on the grass and gazed at the merciless firmament above him. Both loved tranquility and the country, and out of it they drank unceasing delight. As Brussels was surrounded by endless fields and fine roads, and both were fond of walking, they made long journeys of many miles, without regard to where they were going, or when or how they would return. In Antwerp their life was the same. There was neither nook, corner, or object of interest that they did not see or explore. Rodin saw all the art there was to be seen. With Rubens he was in love, and copied, from memory, in his room many of the great painter's pictures. Of the art, he says, that "It is all in the paintings, with the exception of Fiammingo's infants. In

[1] All rights reserved. Continued from page 45, No. 683.

sculpture, there is nothing else great, though some of it is excellent in execution."

It was in Brussels, in 1872, that Rodin exhibited "The Broken Nose," in the Artistic Circle, and received, for the first time, words of commendation for it. They came from Biot, the engraver, and Bauré, a sculptor. The mask was generally admired and helped to make him friends. Among them was M. Jules Petit, a French singer, whose bust Rodin made in terra-cotta. An especially interesting friend was Dr. Thiriar, now a very prominent member of his profession, whom Rodin came to know in this way: He was taken suddenly ill, from overwork, and Mme. Rodin ran for the nearest physician, who proved to be lame. He came, examined his patient, performed an operation and made a number of successive visits. "When I asked him for his bill," relates Rodin, "the doctor seeing, no doubt, that we were not rich, said, very timidly, that he thought that a dollar and twenty-five cents would not be too much. I was so charmed with his conduct that I went soon after to see him, and told him that I should be happy to make his bust as an acknowledgment of my appreciation of his kindness. He hesitated at first, but soon afterwards, consented, and I made it in terra-cotta. I learned, later on, that he consulted some of his friends and made some inquiries in regard to my capacity. Another bust that I enjoyed making, and one of the best I ever executed was of an apothecary, named Vanberkaeler. I made it in marble, though I was not paid for it. He had a remarkable head, of pure Flemish type, with a slight touch of Greek in it." These busts were exhibited, and very highly and justly spoken of by the Brussels papers. The apothecary's bust especially, was praised for its powerful character, and largeness and nobility of style. "A veritable bit of the antique, did not its coat reveal its time and place." The bust of "La Petite Alsacienne," which Rodin had made in Strasbourg, was also shown in Brussels and greatly admired.

Although he had fairly good friends in that city, they could do but little or nothing for him. To all intents and purposes he was quite as isolated as he had been in Paris. Society did not attract him. His home and his studio were his heavens. His general want of close friends, or even interested acquaintances, was often the cause of serious trouble, as the following incident will illustrate: When he went to Brussels he left in his studio, in the Rue Hermel, a large number of precious sketches, a quantity of valuable plaster casts and a clay figure, larger than life, upon which he had worked for two years, had cared for through the war with great difficulty, and upon which he set a high value. All at once, the owner of the studio, one Robinet, took the fancy that he wanted it, and without even informing Rodin of his wish, sold its contents at auction. Nor had Rodin a friend in Paris who cared enough for his interests to either inform him of this shameful transaction, or try to protect his property. When Rodin returned to Paris, instead of finding his studio safe and sound, ready for his occupancy, he discovered that his possessions were scattered to the four winds, and his clay figure, broken to pieces for the purpose of getting the iron that supported it, to sell to a junk dealer. It was truly, as he mournfully says, one of the cruelest events of his life.

As a whole, Rodin's experience in Brussels was like that of all artists everywhere who are entirely given up to their work. The world cares little for them or their art; it only cares for those who care for it. Art, pure and simple, has never won for its creator any particular personal attention, nor is there any reason why it should. Occasionally the artist and man of the world are joined together in one person, as in the case of Rubens. Rodin's groups, bas-reliefs and busts, were forgotten as soon as made, and as things go, there was no reason why their author should be longer remembered.

T. H. Bartlett.

The Illustrations

[Contributors are requested to send with their drawings full and adequate descriptions of the buildings, including a statement of cost.]

HOUSE OF CHARLES PRUYN, ESQ., ALBANY, N. Y. MR. R. W. GIBSON, ARCHITECT, NEW YORK, N. Y.

[Gelatine print, issued only with the Imperial Edition.]

COMPETITIVE DESIGN FOR THE WORLD BUILDING, NEW YORK, N. Y. MR. R. H. ROBERTSON, ARCHITECT, NEW YORK, N. Y.

HOUSE FOR M. S. SEVERANCE, ESQ., LOS ANGELES, CAL. MESSRS. CURLETT, EISEN & CUTHBERTSON, ARCHITECTS, LOS ANGELES, CAL.

THE PLACE OF ARMS, SANTIAGO, CHILI.

THE LOTUS IN ANCIENT ART.—I.

THE IONIC CAPITAL AND THE LOTUS.

Fig. 1.

THE object of this paper is to call attention to certain previously unknown or insufficiently developed facts, relating to the influence of the lotus on Greek ornament which it is hoped may prove of interest, not only from a professional, but also from a popular standpoint.

As introductory topic I have chosen the subject of the Ionic capital, a hitherto unrecognized conventional lotus form. This topic will be found to lead over to that of the anthemion, in other words to the one all-important typical form of Greek ornament,—in its various modifications the most universally recurrent feature of modern decoration. The anthemion is a hitherto unrecognized conventional development of lotus decoration, and in its early history that of the later Greek spirals and scrolls is also involved. In the demonstration to be offered on this head, the "rosette" is included as another hitherto unrecognized lotus motive. The most apparently improbable, yet, most easily demonstrated case of lotus decoration in Greek art is that of the "egg-and-dart" moulding. Its association with the Ionic capital and other Ionic details, is an interesting point connected with the lotiform origin of the latter.

The suggestion that the "egg-and-dart" moulding is derived from an Egyptian lotus border has been previously made by Owen Jones but his interpretation of the evolution is unsatisfactory. I was not, however, aware of his suggestion when my own conclusions were formed. The suggestion that the Ionic capital is a lotus form has also been previously published but without attracting conviction or attention. In this case also the interpretations hitherto given of the evolution are insufficient and in this case, also, my own observations were made without knowledge of the anticipations as regards publication. As publication is universally admitted to be the test of precedence, I only mention the fact that the entire series of observations was made independently, because they have all been based on the study of lotus forms found on Cypriote vases, and because the clue offered by these vases is in my own conviction the only correct one—the only starting-point that will compel from experts in history, in archæology and in decorative art a recognition of the facts asserted. This has not been hitherto accorded the suggestions of a lotiform origin for the Ionic capital and the "egg-and-dart" moulding by any standard authority, nor has the slightest notice been hitherto taken of the isolated suggestions which were correct intuitions of most important facts.

As regards the anthemion, the rosette, and the Assyrian palmette (to be mentioned presently) I believe that both my observations and demonstration are unanticipated, as the demonstration is in all cases. From the observations bearing on the Ionic capital and the anthemion, the Corinthian capital will prove to be a later and remote phase of the same initial motives.

The now generally accepted theory of the Ionic capital and the universally accepted theory of the rosette and anthemion, is that the Greeks obtained them from Assyrian ornament, by Phœnician transmission and by way of Asia Minor. This theory will prove to be no longer tenable and the Assyrian "palmette" itself, hitherto considered the first form of the anthemion, will be proved an Egyptian lotus motive, not a conventional palm-tree as hitherto supposed.

That the Greek spirals and Greek frets are of Egyptian derivation is already obvious from recent publications.[1] Mr. Joseph Thacher Clarke has offered convincing proof on the long-debated subject of the Egyptian origin of the Doric shaft in a recent number of the *American Journal of Archæology* (Vol. II, No. 3). Similar proofs have also been lately published on the head of the Doric Triglyphs.[2] The discoveries at Naucratis, the most important and ultimately the only Greek Colony of the Nile Delta, of which the Boston Museum of Fine Arts offers such interesting specimens, have also given an impetus in various ways to the disposition to connect the origins of Greek art with influences from Egypt.

Thus the demonstration to be offered for the lotiform origin of the Ionic capital, of the anthemion, of the rosette and of the egg-and-dart moulding, will, if it proves satisfactory, only substantiate and widen a point of view for the history of Greek art in general, which has already been acknowledged probable or clear in important particulars. In 1873 when the Cypriote pottery of the Cesnola collections was first exhibited in New York, I called the attention of friends whose testimony is still available to certain cases of lotus decoration, such as appear on the vase in the Metropolitan Museum of Art, herewith

[1] Prisse d' Avennes's "*Histoire de l'Art Egyptien;*" Schliemann's "*Mycenæ,*" "*Orchomenos,*" and "*Tiryns.*"

[2] Auer in "*Zeitschrift für*" *Bildende Kunst*" 1880 (colored illustrations at the close of Durm's "*Baukunst der Griechen.*")

figured, with enlarged details from similar vases (Figures 1, 2, 3,) which seemed to me to argue a lotiform derivation for the Ionic capital.

The lotiform derivation of the Ionic capital was first suggested, but on other, and I think it will appear on less satisfactory grounds, by French students in 1875 and 1885. In 1875 Georges Colonna-Ceccaldi (since deceased) published an article in the *Revue Archéologique* on a Cypriote sarcopagus now in the New York Museum and known as the sarcopagus of Athience, in which he also published one of two tombstones found with it and also now in the New York

Fig. 2.

Fig. 3.

Fig. 4.

Fig. 5.

Museum. One of these is figured at 4. He asserted this stèle to be a conventional representation of the lotus in which the triangle between the volutes figured the ovary of the flower. The volutes themselves were interpreted as petals curled over and the introrse scrolls above were supposed to represent the stamens. It will be subsequently shown that the details of this interpretation are all erroneous but it will also appear that the intuition regarding the entire form was correct. As the lotus is an Egyptian symbol of the Resurrection, the suggestion in this sense was extremely apt although this point was not made by Colonna-Ceccaldi.

In 1885, Mr. Dieulafoy, the distinguished explorer of the ruins of Susa, announced the lotiform origin of the Ionic capital in his "*Monuments Antiques de la Perse.*" His starting-point was a form of Egyptian capital found in relief representation at Karnak (eighteenth dynasty): figured at 5. He interprets the scrolls as representing lotus petals conceived as curling downward under pressure and the object between them as a representation of the ovary. It will appear later that this interpretation which corresponds essentially to the earlier one by Colonna-Ceccaldi, is also incorrect in detail but correct as to result.

In 1886, a summary of the literature of the Ionic capital up to date, was published in the *American Journal of Archæology* (Vol. II, No. 1[1]), by Mr. Joseph Thacher Clarke which did not include the suggestion of its lotiform derivation. This led me to examine the New York Cypriote vases more closely and to connect the lotus motives on them with others, to be subsequently illustrated, in such a way that I believe the fact may now be asserted definitely and conclusively that the Ionic capital is derived from a conventional form of lotus flower and that it is of Egyptian origin. My view has been adopted by Prof. Allan Marquand, of Princeton, in a recent number of the *American Journal of Archæology*, (Vol. IV, No. 1). It has been considered with much interest and I believe with approval by Prof. A. L. Frothingham, Jr., of Princeton, the editor of the *Journal* and has otherwise met the approbation of experts. The observations on the Ionic capital led me to those on the anthemion or palmette, a more important, because a more universally employed decoration and there seems to me, to be no escape from admitting that they are a necessary consequence of the demonstration for the Ionic form.

The interest of the related observations is considerably enhanced by the recent successful efforts to naturalize in this country the various water-lilies, commonly known by the one name of "lotus" and by the opportunities to observe the natural flower which many of us have thus recently enjoyed. Mr. E. D. Sturtevant, of Bordentown, N. J., and Mr. Benjamin Grey, of Malden, Mass., are florists who have been especially prominent in this connection. From the lily-ponds of the former the fountain basins of the various parks in New York have, for instance, been very generally stocked with lotus-plants of all three kinds known to the ancient Egyptians.

The cut numbered 6 shows a selection of details from these plants, combined from sketches made in Union Square, New York.

The plant most generally quoted as a "lotus" is now extinct in Egypt and Africa, but still grows in Asia. It bears the flower so well known in Oriental art and decoration as the emblem of Buddha. According to botanical terminology, this *nelumbium speciosum* is not a lotus. It is distinguished by the peculiar seed-pod seen on the left of the cut, shaped like the spout of a watering-pot and containing seeds about the size of small filberts, by a bulbous, tulip-like shape of bud, by much larger petals than belong to the lotus proper, and by the fact that its leaves grow by the centre in bell-shaped form on erect stems rising above the water. Botanically speaking, the word "lotus" is confined to the large white water-lily, *nymphæa lotus*, and large blue water-lily, *nymphæa cerulea*, but the flowers of all three kinds of plants are closely allied in appearance, aside from distinctions of color. All resemble the common pond-lily, although superior to it in vigor, beauty, and size. Unlike the pond-lily, the flowers of all three plants rise high above the water on erect stems. The leaves of the white and blue lotus float on the water.

The pond-lily occasionally exhibits a phenomenon as regards the calyx leaves, which can be more distinctly observed in the Egyptian water-lilies, because they are larger and stand so high above the water. In the Egyptian varieties of the lotus the calyx leaves forming the outer coarse-green envelope of the bud and partly-opened flower frequently or occasionally curl over and downwards after the flower opens, as seen in the cut, and as represented in the flowers of certain Cypriote vases above referred to (Figs. 1, 2, and 3). This downward curl of the calyx leaves appears to have been the starting-point of a lotus motive with exterior volutes, ultimately developed into spirals, which, for decorative reasons, finally became, as far as the Ionic capital is concerned, the one remnant of the original floral form.

The suggestion of Colonna-Ceccaldi and Dieulafoy that the Ionic volutes represent curling lotus-petals is not supported by any related appearance of the natural flower, as the petals never curl downward

Fig. 6.

or outward. When the lotiform origin of the Ionic capital has been universally conceded, the details of the interpretation would not be a matter of vital importance. As long as these intuitions of the true origin of the Ionic capital have not been quoted or mentioned by a single authority, it is important to present an interpretation which compels acceptance. The first step in this direction is to insist on the point that the lotus-flower occasionally exhibits a phenomenon which was observed by ancient decorators in a manner to which the Ionic volutes fairly correspond.

The different lotus-varieties, as above described, are occasionally distinguished by naturalistic coloring in Egyptian design, the blue lotus especially, but more frequently only the form of the flower is indicated in a variety of color combinations of purely conventional character. It does not appear that the rose-lotus, *nelumbium speciosum*, had a more distinctly sacred character in Egypt than the white and blue water-lilies, although this has been sometimes supposed. Egyptologists simply speak of the "lotus," without distinction as to its varieties in the information given as to its sacred significance.

The opinion of Wilkinson, expressed in his "*Ancient Egyptians*," that the lotus had no sacred significance must be abandoned, in view of the numerous opinions of later authorities. It was a symbol of the Resurrection, according to Pierret ("*Panthéon Egyptien*," p. 62). It was the flower sacred to Osiris, the God of the Resurrection, and usually crowned the altars of offerings to him. The four "Genii of Amenti," *i. e.*, of the world of departed spirits, are for this reason sometimes represented in Egyptian pictures of the "Last Judgment" and otherwise as standing on the lotus. Bouquets of lotus-flowers were presented to the guests at Egyptian funerals, undoubtedly for this same reason.[2] According to Maspéro, the lotus was one of the mystic forms or habitations of the departed spirit. According to Prisse d'Avennes, the lotus was an emblem of life and of immortality.

The association of the lotus with Osiris explains that with Horus, the child of Osiris and Isis. The infant Horus appears frequently in Egyptian temple-reliefs seated on the lotus, or rising from it. In his various guises of hawk, of hawk-headed human being, or human-headed hawk, the lotus constantly appears as his attribute, as it is also that of Isis. The identity of Horus with the sun and with the solar-winged disk (Pierret) so constantly represented on the Egyptian monuments thus explains, also, an association of the lotus with solar worship, and involves the fact that the lotus was a symbol of the sun, which can, moreover, be abundantly demonstrated from monuments to be subsequently quoted. Finally, the flower is known to have been a generative emblem. For this significance, the association with Osiris in his generative and reproductive character is sufficient demonstration. The association of the lotus with Phallic representations of the Egyptian divinities is very common. As the Apis

[1] "A Proto-Ionic capital from the site of Neandreia."

[2] Osburn's. "*Monumental History of Egypt*," Vol. I, p. 43.

Bull was considered an incarnation of Osiris, the association of the lotus with Apis is also a frequent appearance on the monuments. The third member of the Egyptian Trinity was Isis, the spouse of Osiris, mother of Horus, and Moon-Goddess. To her, also, the lotus was consequently sacred.

In the decorative motives of the Egyptian tomb pictures, borders, panels, friezes, etc., the lotus is the most constant and almost exclusively dominant form. In the temple architecture it forms the basis for all capitals antedating the Ptolemaic period (see Reber's "*History of Ancient Art*"). The Egyptian words for lotus and for the capital of a column are interchangable as appears from translations of Maspéro in his "*Historie des Peuples Anciens de l'Orient.*" Although the papyrus has been frequently considered as having suggested the motive for the campaniform capital the contrary can be conclusively demonstrated. Other confusions of lotus-forms with that of a supposed papyrus can be also shown to have been made and increase the admittedly overwhelming prepondence of the lotus and its derivatives in Egyptian decoration to a maximum which is almost exclusive of other forms as regards surface ornament.

The preponderance of lotus motives in Egyptian art and decoration, being sufficiently explained by the dominance of the Osiris and Horus cult and by the well-known hieratic and symbolic character of all Egyptian art, we have no difficulty in recognizing the source and *raison d'être* of the lotus motives so constantly found in the decorative art of the Phœnicians and on the vases of Cyprus.

The solar cult was a dominant one among the Phœnicians and their adoption of Horus worship, of the winged solar disk and of various forms of lotus decoration from the Egyptians, is one of the most palpable illustrations of their well-known dependence on Egyptian influences, Rénan speaks of Phœnicia as a "province of Egypt" in matters of religion (*Mission de Phénicie*). The myth of the death and resurrection of Osiris is distinctly connected with localities on the Syrian coast, and the worship of Osiris is known to have been especially affected at Byblus, of which seaport the earliest Phœnician colonists of Cyprus were native. It is also recorded to have been the distinctive cult of Amathus, one of the oldest Phœnician settlements in Cyprus. Such special points are not as important as the general one, that Phœnician decoration exhibits a preponderance of lotus forms and derivatives, similar to that found in Egyptian art and explained by it. The close and early relations between Phœnicia and Egypt are made especially vivid by the fact that the cedar oil on which the Egyptians were absolutely dependent for their most generally practised method of embalmment (the second in the scale of costliness and pomp) was entirely supplied by Phœnician commerce and manufacture.

The dependence of early Cypriote art on the Phœnicians of Syria, and the general dependence of the Phœnicians on Egypt for many mythological conceptions, and for the symbolisms, forms and motives of their own hieratic art, thus justifies a treatment of Cypriote decorative art from a standpoint which regards it as a unit in the matter of its lotus motives, and which justifies the search for analogies between decorative motives of Cypriote capitals and stèles and those found on its pottery. The stèles in question were tombstones. The pottery has been, without exception, found in tombs, and as the lotus was the Egyptian symbol of the Resurrection, and also of a solar Horus worship especially affected by the Phœnicians, the association is palpably significant. The worship of the moon and of a moon-goddess, either Isis herself or one assimilated to her, or both, is well-known to have been a prominent Phœnician cult. Hence the associations of the lotus with Isis worship above explained are also in point.

Fig. 7.

As for Phœnician capitals, which are known by a number of reliefs to have especially favored the Ionic form, we may, without insisting in all cases on a symbolical significance, which can be shown to have existed in some cases, simply point to the general fact that Phœnician architectural decoration was especially derived from Egyptian sources, and that lotus Ionic forms can be demonstrated to have existed in Egypt near the eighteenth century B. C. (beginning of the eighteenth dynasty). One indication of this fact is offered by the painted imitations of architectural capitals in wood or metal, of which an illustration is offered at Fig. 7, from a tomb at Thebes of the time of Menephtah, son of Ramses II. The Ionic form appears distinctly in the upper member of this capital.

As regards the pottery of Cyprus, it is not necessary to assume that the decorators of the vases had invariably preserved a consciousness of the symbolical significance of the lotus decorations so universally found on them. The Greek colonists of Cyprus borrowed the Phœnician art before the dawn of recorded Greek history, and before there was an independent art in Greece; but, with a conservatism otherwise attested for the Cypriote Greeks, and otherwise unknown to Greek art, they perpetuated these Phœnician forms down to the time of Alexander the Great and later. In the demonstration to be subsequently offered we are thus freed at the same time from difficulties regarding the question of dates, and from the suspicion calculated to fall on those who look for symbolical meanings in Greek decoration. The lotus motives were traditional, and had been conventionalized to an extreme degree in their symbolical stage, and the art of Cyprus was so conservative that the most expert students are unable to distinguish between the pottery of Cypriote Greeks and that of Cypriote Phœnicians, or to specify distinctions in style dependent on succession of time in either case. Vases demonstrably of the second century B. C., resembling Fig. 7, belong to types, and show lotus motives which are demonstrably as early as the fifteenth century B. C.

The same conservative character in Cypriote art also saves us from the uncertainty regarding dates in the matter of the Cypriote proto-Ionic stèles and capitals to be illustrated and considered. These may be individually of relatively late date (Figure 4 is certainly not earlier than 500 B. C.), but there is no doubt that they represent types of sufficient antiquity to serve as links in a chain of demonstration affecting the Greek Ionic forms. A glance at the geographical position of Cyprus, the only spot on which Greeks and Orientals met and amalgamated from the earliest to the latest dates of Greek history without interruption and without national feuds or animosity (before the time of the Persians), gives sufficient explanation how and why connecting links of all kinds for the relations of Greek and Oriental art, as well in sculpture as in architecture, should be found on this particular island. The peculiar conservatism of the Cypriote Greeks is undoubtedly explained by the same Oriental influence and character.

The foregoing preliminary remarks are essential to a satisfactory argument based on the illustrations to be subsequently presented. Above all, the point must be kept in view that Cypriote Greek art in general exhibits the first stage of the development of Greek art in general, of whatever date the individual piece of record. A few words are now necessary as to the present accepted theory of the origin of the Ionic capital.

Standard authorities are united, so far, in deriving the Ionic capital from Assyrian architecture. So far as actual remains are concerned, only one Assyrian capital has been published, and only two or three capitals are known to be in existence. The evidence is found in Assyrian bas-reliefs, notably in an ædicule represented on a relief from Khorsabad, figured at 8, and in the capitals of an ædicule represented on a tablet found at Sippara, in Babylonia, and hence known as the Sippara tablet. This form of capital is figured at 9. The latter is dated between the eleventh and ninth centuries B. C. The Ionic of Khorsabad is of the eighth century B. C. As there are no definitely dated Greek Ionic capitals earlier than the fifth century B. C., and no records of Greek Ionic temples earlier than the sixth century B. C., the precedence of the Assyrian forms is clear, and the presumption in favor of the Assyrian origin of the Greek Ionic is apparent.

Fig. 8.

Fig. 9.

From the standpoint of this presumption, Mr. Clarke published in the essay previously mentioned a capital which he recently found at Chigri (ancient Neandreia), in Asia Minor, during his explorations at Assos (Figure 10). This capital was supposed by him to be a corroboration of the theory advanced by the German architect and æsthetic critic, Gottfried Semper, in his work on "*Style.*"[1]

Semper considers the volutes at the base of the Assyrian palmette,

Fig 10.

Fig. 11.

of which one form is shown at Figure 11, to be the original starting-point of the Assyrian proto-Ionic. The palmette form itself has been universally considered a derivative from the palm-tree, as represented on Assyrian reliefs (Figure 12), and Mr. Clarke supposes the pendant bunches of dates, which are always conventionally represented as shown in the cut, to be the starting-point of the decorative scrolls at the base of the palmette.

Semper's theory conceives that the upper palmate portion of the palmette was gradually eliminated in architectural usage, as unfitted for position under pressure, and that the scrolls were consequently and correspondingly developed. Mr. Clark naturally considered the Neandreian capital to be a vestige of the palmette origin of the Ionic, and published in support of this view three details of ivory plaques from Nineveh, in the British Museum, one of which is figured at 13. These details appeared clearly enough to be connecting forms between 10 and 11, and might fairly be considered representative of similar lost architectural capitals. As the Greek

[1] "*Der Stil in den technischen und tektonischen Künsten.*"

anthemion (typical form from an Attic vase at Figure 14) has so far been always related to the Assyrian palmette and to the palm-tree, through that ornament, the attractions of a theory which unites the anthemion and the Ionic capital as developments from the same starting-point are apparent, and the connections between 10, 13 and 14 are too obvious to be disregarded. Moreover, two other

Fig. 12

Fig. 13.

Ionic capitals, more or less similar to that from Neandreia, have been still more recently discovered at Athens, and have just been published by Mr. Trowbridge, in the "*American Journal of Archæology*" (Vol. IV. No. 1).

It thus appears that the theory of the lotiform origin of the Ionic capital which necessarily carries with it the theory of an Egyptian derivation, is antagonistic to the accepted theory of an Assyrian origin, and also to recent corrobations of this theory of an apparently conclusive character. It is clear that no theory of Ionic origins can now be accepted which does not reckon with the capital from Neandreia. But the antagonism is only partial, and is more apparent than real. It would be absurd to question the importance of the Assyrian proto-Ionic as, at least, the possibility that it was a reactive element through Asia Minor on the development of Greek forms. It is only necessary to show that the Assyrian proto-Ionic forms are themselves derived through Phœnician meditation from Egypt, and that the Egyptian Ionic passed more directly to the Greeks by way of Syria and Cyprus. This can be done by analogies between the Egyptian Ionic and the lotiform Ionic motives of Cyprus. The ivories which are so interesting as connecting links can be shown to belong to a series of admitted Egypto-Phœnician manufacture.

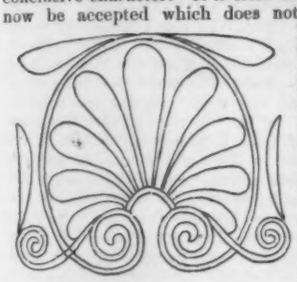


Fig. 14.

The crucial question is that of the Assyrian palmette. Strange as the assertion may seem, this form is not originally Assyrian, and it is not a palmette, *i e.*, not a palm-tree. As remarked at the opening of this paper, the "rosette" which has so far been always considered an Assyrian and Babylonian decoration, is an element of the problem. This is also Egyptian, and it is also a lotus motive.

These points are naturally too important for despatch in a single paper, and it will, therefore, be understood that the analogies and comparisons for the Ionic capital, which appear in a following article, are also introductory, and that they are not propounded as absolutely conclusive alone and in themselves before the consideration of the anthemion is reached. That they will, at least, throw the scales of the balance into equilibrium, as regards the rival claims of Egypt and Assyria I have not the slightest doubt. As the question is one which involves most of the scrolls, spirals and rosettes of modern decoration; beside the Ionic capital itself — the tracing back of these various motives to a single typical flower — an emblem of the belief in a future life so dear to the ancient Egyptians is a matter of general popular interest. I presume that the archæological considerations involved may be considered interesting in their results, if not in themselves.

WM. H. GOODYEAR.

[To be continued.]

COST OF EXECUTING SOME CLASSES OF ENGINEERING WORK.[1]

Capital from Rosheim.

DURING the past twelve years, while in charge of various engineering undertakings, the author has devoted a good deal of attention to the cost of executing different classes of work, and it has occurred to him that a short paper on this subject might not be uninteresting. He regrets that he has not taken full advantage of his opportunities in this way, and also that some of his memorandums have been lost in moving about.

The author proposes to take up the following classes of work: — 1. Puddle trenches and puddle. 2. Miscellaneous earthwork. 3. Concrete work. 4. Masonry.

The factors which appear chiefly to demand consideration in endeavouring to arrive at an estimate of the probable cost of excavating any puddle trench are: — 1. The geological strata to be cut through. 2. The quantity of water likely to be met with. 3. The maximum and average depths from which the spoil has to be excavated before the impervious strata are reached. 4. The methods of excavation to be adopted.

The first two of these, which might, perhaps, be more properly taken as one, the second being a consequence of the first, are necessarily the most important considerations in determining both the cost of execution and the ultimate success of any puddle trench. Before the site of an embankment is finally fixed on, its geological formation should be very carefully investigated, not only by means of borings, which, taken by themselves, are generally very illusory, but by trial pits, the number depending on the length of the trench, sunk well into the strata in which it is proposed to found. Great is the difference in the amount of work done per man day, in different materials, at about the same depth. For instance, in trap or whinstone rock at a depth of 40 or 50 feet from the surface, a man can barely excavate $\frac{1}{4}$ a cubic yard per day, at a cost of about 8*s.* per cubic yard, whereas $2\frac{3}{4}$ cubic yards of sandy clay or blaes can be removed at the same depth, costing only about 2*s.* 3*d.* per cubic yard.

It is obvious, also, how seriously the expense of excavation of an otherwise easy material may be augmented by the presence in it of water in large quantities, quite apart from the mere question of pumping. This is, perhaps, best exemplified by sand, which, when dry, can be taken out more easily than anything else, but when it is changed into running sand by water, and if mingled with boulders, often gives an infinite amount of bother. In the case in point, for a time, only $\frac{1}{10}$th cubic yard could be got out per man day.

The next point to be considered is the depth at which the excavation has to be done. For the first 5 feet the soil can be cast out as it is dug, but below that depth either a staging must be introduced, and the stuff cast onto it, and from it again to the surface, or in the wings of the trench it may be wheeled out in barrows. When the depth exceeds 12 feet or 15 feet, mechanical aid must be called in, and the materials excavated raised to the surface by horse or steam-power, by appliances similar to those already described. As might be anticipated, the reduction due to this cause is most rapid down to a depth of about 15 feet. It then becomes gradually less, until, after 30 feet is reached, it is comparatively slight, and is due almost exclusively to the time lost in lifting the spoil and to the diminishing amount of light which reaches the bottom of the trench as the depth increases, especially in winter. Additional depth also means additional pumping-power, which must not be left out of account.

Puddle. — The cost of puddle varies in proportion to the distance from which it has to be conveyed to the embankment and the nature of the clay, boulder clay requiring much more working to make it into good puddle than some of the softer clays, and it also requires to have a great many stones picked out, though this is frequently carried too far, a few stones, if they are not too large or allowed to touch one another, being in some respects rather an advantage than otherwise, as they tend to prevent the clay from cracking and fissuring, in contracting, and also somewhat increase its weight. If water for "souring" the clay is difficult to obtain near the site it adds to the cost. It is generally best to "sour" for clay as close to the bank as possible to reduce the weight of material transported, and also because the water from it assists the subsidence of the banking. On the Paisley Water-works one of Priestman's diggers was used with very good results for lifting the puddle from the heaps and casting it into the trench. Puddle in the trench usually costs somewhat more than that in the wall, all other things being equal, on account of the pumping required and the labor expended in removing timber.

Miscellaneous Earthworks. — Most of the remarks already made with reference to the cost of excavating puddle trenches apply to that of sinking deep foundations, in which neither caissons nor coffer-dams are used. In excavations, when barrow-work is resorted to exclusively for the removal of the soil, the work done per man engaged depends considerably on the length and gradient of the barrow road; if this be level or nearly so, an additional wheeler must be put on for every 30 to 35 yards of distance, or if on a slope of say 1 in 10, the length of the stages would require to be reduced to about 25 yards. In the case of rock excavation, not only is the degree of hardness of the rock to be considered in estimating the cost of its removal, but also the way in which it is "bedded" forms an important item. Especially is this so in taking out narrow channels and foundations, and there is much more scope in this class of work for the exercise of economy in the judicious use of explosives, etc., than in ordinary earthwork.

Concrete work. — In making concrete, the labor expended per cubic yard is greatly dependent upon its mass form, and the amount of face work, if any, per cubic yard. In foundations, under ordinary conditions, about $2\frac{3}{4}$ cubic yards can be mixed and put in per man day by manual labor, whereas in confined positions, such as in coffer-dams, etc., this may fall as low as $\frac{1}{2}$ cubic yard per man day. It is always of importance to place the mixing-platform as nearly as possible on the same level, as well as as close as possible to the position where the concrete is required, on account of the disgregation of the materials caused by a tip of a considerable height; and to wheel it down a steep incline is hard on the men and leads to the loss of time. In making the screening-well at Acreknawe Reservoir and Waterworks, which was constructed of concrete faced with bricks, only $1\frac{1}{4}$

[1] From a paper by Mr. A. Fairlie Bruce, read at a meeting of the Civil and Mechanical Engineers' Society.

cubic yards were done per man day in the lower part of the wall where the concrete had to be wheeled down a slope of 1 in 10, whereas 2.55 cubic yards were done per man day in the upper part with a barrow road at 1 in 50. In designing concrete work, both with a view of saving time and to obtain good work, it is advisable to make the corners as few as possible, and with large "splays," and the curves of as large a radius as the exigencies of the work will admit of, as sharp radii involve a good deal of loss of time in framing. Making all due allowance, however, for economy in labor, to be effected by careful design and management, the cost of concrete-work is chiefly dependent, the proportions being the same, on the local conditions governing the price of cements, etc. If cement and sand are dear, and a good rubble is easily obtained, it is often cheaper to use it than concrete, and in many cases quite as efficient, as the cost of breaking stones is saved, and somewhat less sand and cement is needed than is required for concrete at, say, 6 to 1.

Masonry.—The price of masonry, like that of concrete, is of course chiefly controlled by local circumstances, which have all to be investigated and weighed before its cost is estimated or its class fixed on; that is to say, whether it is to be brickwork, ashlar, or rubble, supposing the particular requirements of the projected work admit of such a choice.

Ashlar.—Save in special cases, such as important copes, etc., in most classes of engineering work where it is necessary to use ashlar, "dabbled" or "scabbled" work will be found sufficiently fine, and the time demanded for them is only about half that needed for "droving," and one-third of that for "polishing," so that they might with advantage be more frequently substituted for these.

Rubble.—As a rule, however, where stone is plentiful, nothing better can be used for work below ground, such as retaining-walls, etc., than good solidly built rubble, faced with what are called in the North "shoddies," *i. e.*, stone squared on the face joints. From 1¼ to 1½ cubic yards can usually be done per man day at this description of work in light retaining-walls, etc., of 2 to 3 feet thick without a crane, and with a crane in viaduct piers. In heavier masses of masonry, such as abutments, heavy retaining-walls, etc., about 2½ cubic yards can be done per man day. In one of the abutments of the Clyde Viaduct as much as 5 cubic yards were accomplished per man day, but in this case the stone used was quarried immediately along-side the building, placed by the quarry steam-crane straight onto the work, which enabled very large stones to be used.

In Northern Italy, where good building stone is usually very plentiful and labor cheap, a good mason only receiving 3.5 lire a day, masonwork can be done very cheaply, the best class of hydraulic masonry, built of mortar, composed of one of Casali cement (an Italian copy of Portland cement), one of Casali hydraulic lime, and four of sea-sand, only costing 10*s.* to 12*s.* per cubic yard in the neighborhood of Genoa. If river-sand is used, the price is reduced to 8*s.* a cubic yard; but this latter, being formed by the action of water on limestone rock, contains silica, and consequently a very inferior mortar is the result.

In conclusion, the author may say that no greater mistake can be made than that frequently fallen into by small contractors of trying to dispense with necessary "plant," carrying on works in a hand-to-mouth sort of way, using manual labor where cranes should be employed and horse-power where steam is required. Money judiciously expended in suitable "plant" is sure to repay the contractor in the long run by saving much more than its equivalent in time, labor, and trouble.

BOOKS AND PAPERS.

THE opinions passed upon the works of Rude have been as variable as the English climate. Lauded to the artistic skies by some as a Burgundian Phidias or Michel-Angelo, he has been scoffed at and depreciated by others, as if there were no merit whatever in his sculptures. Perhaps the truth lies, as usual, in a middle course.

Born of humble parents in a back street of Dijon, in 1784, Rude seems to have imbibed democratic notions while working at his father's forge; for in 1792, such was the enthusiasm of the latter, for the cause of the Republic, that he enrolled the boy in a scholastic corps called by the people, the *Royal-Bonbon* regiment. Thus his life was divided between smithing and soldiering, until an accident in the form of a red-hot bar falling upon his foot, turned his attention to drawing; and, when about sixteen years old, he began seriously to take lessons, working early and late. In 1807 he went to Paris and was employed by Denon upon the Vendôme column. This and the stirring events which were quickly succeeding one another, seem to have made him a violent Bonapartist; and we find him and four or five fellow-students turning the heads of the soldiers who accompanied Marshal Ney to Dijon, to stop the progress of the *ogre de Corse*, on his return from Elba. Rude and his friends stood on the steps of the theatre, and as the troops passed (some 18,000 men) the boys cried, "*Vive l'empereur!*" The first detachment went by, astonished, but unmoved; but, as the cry was repeated over and over again it took effect, and the soldiers joined in with a unanimous "*Vive l'empereur!*" and next day the officers followed suit. After Waterloo, Rude joined David the painter at Brussels, where a great deal of his work was accomplished, and where he married Sophie Frémiet, an accomplished artist and musician. Besides being a painter of merit and pupil of David, Sophie was an enthusiast, for when her husband had no money to continue his "Pêcheur Napolitain," she suggested that they should sell some necessary garments: "*Nous vendrons nos chemises*"! All artists are not blessed with such self-sacrificing partners, unhappily; but, then, Rude's wife knew the trials of making bricks without straw, and the miseries of being stayed from carrying out great ideas for want of a little necessary filthy lucre.

Whatever Rude may have been as an artist, his private life was exemplary. He loved his home and his work, and in the evenings when not drawing or modelling, he read or listened to his wife's music. An indefatigable worker, and in merit the equal of any of the sculptors of his own time; he never was received at the Institut, because he was above scheming for a *fauteuil;* but, nevertheless, he acceded upon one occasion to the persuasion of his friends, and became a candidate. Promised by many that he should have their votes, the election proved that he had had none. But there was no love lost between him and the *Immortels;* for, while he called them the *pâtissiers*, they dubbed him "*l'homme à la barbe*"; and when he heard of his unsuccess, he said to his wife, "*T'u vois bien, Sophie, qu'il faut que je laisse pousser mes moustaches, on dirait que je me rase pour entrer à l'Institut.*" Perhaps M. Daudet is not quite wrong in his estimate of "Les Immortels."

Of Rude's work as a sculptor M. Bertrand speaks enthusiastically. He considers the "Mercure rattachant ses Talonnières" superior to the "Mercury" of Jean de Bologna. In this I cannot agree, nor in M. Bertrand's estimate of Rude's other works, for his classical subjects always strike me as resembling Canova's namby-pamby gracefulness; and his religious ones, Thorwaldsen's false sentimentality. What can be weaker and more maudlin, for example, than his "Baptism of Christ" in the church of the Madeleine, Paris? and, although his "Départ des Volontaires," on the Arc de Triomphe, has a certain grandeur in the "movement," it decidedly approaches clap-trap. The *Salons* for the last eighteen years have contained "Liberties" innumerable, grander in effect and far less shrieking. Again, what can be more hideous than the "Napoléon 1*er* s'éveillant à la Posterité," in the Parc de Fixin. A plinth, upon which rests a rock and an eagle in the agony of death; at the summit Napoléon sleeping upon a bier, all but covered with a sheet. —Can a subject be more utterly unfit for sculpture? Perhaps Rude's best work is his recumbent statue of Cavaignac in the Montmartre Cemetery, which has something of the feeling of the Renaissance sculptors. But when M. Bertrand places such work upon a par with the grand tombs of Louis XII, by Jean Juste; of Henri II, by Germain Pilon, and of François I, by Philibert Delorme; or with the works of Jean Goujon, of Michel Colombe, of Ligier Richier, of Jean Cousin, of Simon Guillain, of Pierre Bontems, of François Anguier, or of Franqueville or Prieur, one cannot help wondering if, for the moment, he forgot what these great men of the French Renaissance have left behind them. Even amongst the moderns, surely the work of Boucher, of Carpeaux, of Chapu, of Paul Dubois, Falguière, Guillaume, Moreau-Vauthier and of many others, quite equals or excels that of François Rude. Whether Rude would have made a better design for the completion of the Arc de Triomphe, than that which was temporarily placed upon it some years ago by Falguière, is very doubtful—but M. Bertrand, no doubt, thinks otherwise. But if one cannot agree with the author in his estimate of Rude as an artist, we may endorse his views upon the man and the teacher: "*Ne craignez pas qu'on vous reproche vos œuvres de débutants et gardez vous d'en rougir jamais vous-mêmes, pourvu que vous fassiez toujours de votre mieux. . . Pourvu qu'elle soit vraie, conforme à la nature, une œuvre aura toujours ce qu'on est convenu d'appeler, sans trop se rendre compte de ces mots énigmatiques, le style et le caractère; substituer à la nature l'imitation d'autrui, les procédés d'école, c'est effacer les différences des hommes et des œuvres, et répandre sur tout ce que l'on fait ce vernis d'uniformité qui est l'opposé du style qui est l'homme même avec ses qualités et ses défauts personnels, l'opposé du caractère qui est précisément le résultat de l'individualité de l'artiste fièrement maintenue dans sa vie et affirmée dans son œuvre. . . . Plus une œuvre serrera de près la nature, plus elle sera décoratice et monumentale; Voyez le Parthénon.*" These are sentiments which every one in our own day will echo, and which are the doctrin s of modern realists: "*Au fond, l'art ne s'ajoute pas à la nature: il la comprend, l'imite et l'interprète.*"

S. Beale.

[1] "*François Rude*," par Alexis Bertrand. Librarie de l'Art, cité d'Antin, 29, Paris.

BUILDING LAW.

THE FINAL PAYMENT CLAUSE IN BUILDING CONTRACTS.

IT has been suggested to us by an architect of this city that a synopsis of the lien laws of the different States and Territories—in so far as they affect the time for the final payment of building contracts—would be of great use to such architects as have occasion to draw contracts to be executed in other States.

We have accordingly prepared the following schedule of what, in our opinion, after careful examination of the various statutes, is the longest time allowed for the filing of liens against real estate by sub-contractors, material-men, or other persons furnishing labor or material to the principal contractor:

Alabama,	4 months.	Nebraska,	4 months.
Arizona,	60 days.	Nevada,	30 days.
Arkansas,	90 "	New Hampshire,	90 "
California,	30 "	New Jersey,	1 year.
Colorado,	40 "	New Mexico,	60 days.
Connecticut,	60 "	New York,	90 "
Dakota,	6 months.	North Carolina,	1 year.
Delaware,	90 days.	Ohio,	60 days.
Florida,	6 months.	Oregon,	30 "
Georgia,	3 "	Pennsylvania,	60 "
Idaho,	30 days.	Rhode Island,	6 months.
Illinois,	3 months.	South Carolina,	90 days.
Indiana,	60 days.	Tennessee,	4 months.
Kansas,	60 "	Texas,	6 "
Kentucky,	60 "	Utah,	30 days.
Maine,	30 "	Vermont,	3 months.
Maryland,	60 "	Virginia,	30 days.
Massachusetts,	30 "	Washington Territory,	60 "
Michigan,	60 "	West Virginia,	60 "
Minnesota,	90 "	Wisconsin,	6 months.
Missouri,	4 months.	Wyoming,	90 days.
Montana,	90 days.	District of Columbia,	3 months.

In Mississippi the time is six months if the amount is over $150. In Iowa and Lousiana, and in Mississippi for amounts under $150, there is apparently no time fixed for filing liens in favor of the owner, though purchasers and mortgagees are protected if the lien is not filed within a certain time.

It is probable that in some of the States where the longer periods obtain, it was not the intention of the Legislature to give to laborers and material-men such extended time; but, we have constructed the schedule according to what seems to us to be the most unfavorable interpretation of the law from the owner's standpoint, with a view to fixing such time for the final payment as shall without any question protect the owner against the claims of all parties other than the original contractors. The time that original contractors, that is, all parties dealing directly with the owner, have for filing liens, is, in some States, different from that given to sub-contractors and others; the owner, however, can protect himself against a claim of lien from all persons with whom he deals directly by requiring a release of all claims on the property before the contract is finally settled. The time for the final payment need not be deferred beyond the last day on which it is possible for third persons to file liens against the property.

The contract should, however, provide that the final payment shall not be due for a period exceeding by a few days the time allowed sub-contractors for filing liens; as the exact day when a building is actually completed, or work on the contract ceases, is often a matter of dispute. It is best to defer the final payment until five or ten days after the time apparently open for filing liens has expired.

The following is submitted as a final payment clause for use in contracts to be executed in Massachusetts; and the same will hold good for other States with the necessary change as to time indicated by the above schedule:

"$—— thirty-five days after the said work shall have been completed in accordance with the terms of this contract; provided, further, however, that no liens shall then have been filed against the property and remain undischarged, and that said contractor shall tender to the owner a satisfactory release under seal of all claims on his part against the owner's estate, and shall also (if requested) furnish satisfactory vouchers, receipts or other evidence that no claim against the said estate can be made by any person or persons who have furnished labor or materials for the work embraced in this contract."

COMMUNICATIONS

THE HARLEQUIN GORGEOUSNESS OF GREEK ARCHITECTURE.

PHILADELPHIA, PA., January 25, 1889.

TO THE EDITORS OF THE AMERICAN ARCHITECT:—

Dear Sirs,—I wish to call attention to an unfortunate paragraph in your review of the "League" exhibition in this week's *Architect* (January 19) in which your correspondent attacks Grecian architecture in such a hasty and unappreciative manner.

It is, perhaps, a human failing to slight and misunderstand that which one is prejudiced against, but the prejudice in this case is so glaring *in itself* and withal so conspicuous in the midst of a criticism characterized by such conscientious aggressiveness and expressed with such simple force that it should not, I think, pass unchallenged.

If your author will take the trouble to look up the subject of Grecian temples he may have occasion to reverse his decision as to their "harlequin grotesqueness" as well as to Mr. Brown's originality in drawing his Caryatid porch without any frieze.

Very truly, HERBERT P. KELLY.

[THE writer of the article on the League Exhibition protests against being accused of a prejudice against Greek architecture. As to Mr. Brown's Caryatid porch, while he can certainly claim that the Erechtheum portico has no frieze, the profiling of the mouldings, together with the special treatment of the upper face of the architrave, give it an effect quite different from his design, although it is not perhaps settled whether even the Erechtheum portico had not once a frieze of some sort. The main question, however, whether the appearance which the Greek architects intended their buildings to have was that of "cold purity," "pure intellect," "abstract form," and so on, as the sentimentalists of the early part of the century maintained, or of "harlequin gorgeousness," (not "grotesqueness,") is best answered by referring to the works of Penrose, Hittorff and Zanth, and many others. Our older readers will well remember the commotion which was caused by the first publication of the result of explorations which showed that all the important buildings on the Athenian Acropolis, retained traces of having been painted. It was announced, by those who professed to have the most profound intuition into the workings of the Hellenic mind, that a Greek was incapable of profaning the purity of his Parian marble by covering it with pigments, and that the traces of color upon it were due to the loathsome levity of the Slavonic conquerors during the dark ages, who daubed with gaudy paint the buildings whose "calm intellectuality" they were incapable of comprehending. This theory greatly comforted the sentimentalists until it was shown that the early Doric temples of Magna Græcia, which no mediæval barbarians had ever approached with their paint-pots, had not only been painted all over, but had been prepared for painting when they were built by the application of a film of stucco to the stone, to form a ground for the pigments. In all important respects the coloring and the patterns agreed with the traces remaining on the Athenian buildings, and subsequent researches have only confirmed, what was already amply proved, that the Athenian temples in the time of Pericles had their delicately profiled mouldings speckled and dotted and streaked with blue and red; that the sculpture upon them was set forth by a blue background, and that the walls and columns were painted in broad stripes and bands, of the most vivid tints. Whether the Greeks showed proper respect for the theories of their future eulogists in behaving so it is unnecessary to inquire. We know now beyond a doubt what they did, and the sooner we accommodate our ideal of them to the facts, the better off we shall be. Unless the building has been repainted recently, the most life-like reproduction of a Grecian Doric portico, as it appeared when its builders left it, is probably to be found in the entrance porch of the Cirque d'Eté, in Paris, an architectural object to which the term of "harlequin gorgeousness" is about as well applied as to any structure we know of. To the writer's mind, the abandonment of the idea that the Greeks were nothing but "cold idealists" greatly improves their position as artists. It is doubtful whether their coloring would appear beautiful to an Oriental, or even to us, but it would have been a strange insensibility that would have made the statue of Athene inside the temple of ivory, inlaid with gold, and left the gods and heroes in the tympanums and the metopes outside to shiver in white marble. We are so accustomed to see our buildings bare, and are, possibly, so sensitive to color, that we have formed a dislike to the idea of exterior polychromy which the ancients or the mediævals could not conceive, and which would quickly disappear if some genius should produce a really successful example of it. If architects who consider a staring uniform white the proper color for the highest effects of architecture would read Chaucer's description of Diana's coral temple, and the iron sanctuary of Mars, they would get some suggestions as to the value that color might have in architecture which ought to furnish them with food for thought.—THE WRITER OF THE ARTICLE.]

BOOKS.

WILKES-BARRE, PENN.

TO THE EDITORS OF THE AMERICAN ARCHITECT:—

Dear Sirs,—Will you kindly let me know through the medium of your paper, what are the best works treating of "Southern Romanesque," also on theatre construction, where I can get them, and the price. You will greatly oblige,

Yours respectfully, E. H. DAVIS.

[(1.) REVOIL'S "*Architecture Romane du Midi de la France*"; Corroyer's "*L'Architecture Romane.*" (2.) Gousset's "*Traité de la Construction des Theatres.*" (3.) Any importing bookseller will obtain them for you.—EDS. AMERICAN ARCHITECT.]

THE FIRE ON THE HEARTH STOVE.

BOSTON, MASS., February 4, 1889.

TO THE EDITORS OF THE AMERICAN ARCHITECT:—

Dear Sirs,—Can any one tell me whether the Fire-on-the-Hearth Stoves, once manufactured by the Open Stove Ventilation Company, in New York, are still made, and if so, by whom, and what is the address? I have used half-a-dozen or so in my practice, and would have used many more, probably, if it were not for the extreme difficulty of getting them. The last one I bought I heard of, after many inquiries, at Salem, Mass., and, secured it, but this seems to have been the sole survivor of the race, and what I shall do when I am next applied to, to recommend a nursery stove, or to get pieces to repair those I have already bought, I do not know.

A NURSERY ARCHITECT.

NOTES AND CLIPPINGS

HOW TO WRITE FOR THE PAPER.—There are not a few scholars, fitted for even the Chair of Rhetoric, who are sadly uninformed in the matter of writing for a newspaper. Possibly they could write a book, but their communications must receive a little—often a great deal—of "doctoring" before they are put into the hands of a periodical compositor. Of course the grammar will usually—by no means uniformly—be satisfactory. What they err in pertains mainly to the mechanical make-up of the manuscript. We note a few particulars where a long experience has discovered amazing defects.

(1.) Abbreviations are an abomination. No one who really knows "how to write for the paper" ever gives "Pres." for President, or "V. Pres." for Vice-President, or "Thurs," for Thursday. Certain abbreviations are established and printed as such—"Mr.," "Hon.," "Mass.," "Esq.," for examples. But when it is expected that the

compositor will put in every letter of a word, those who know "how to write for the paper," will *write out* every word. In editorial offices where the incumbent feels at liberty to be autocratic, the sight of an abbreviation is the occasion of instant doom. More humble, we usually fight down a vexation and fix the manuscript.

(2.) It seems a small thing to complain of the writing on little bits of paper. Marriage notices often come on slips less than the size of one's hand. These we must stick to a bigger sheet, else the danger of its blowing away is imminent. Nothing should be put on a sheet of less size than note paper. We are always glad when the size is that of letter-sheet. Of course we make no complaint of postal cards.

(3.) Paragraphing is largely arbitrary. It ought to have regard to the physical appearance. Some of the English newspapers will give a whole column without a break. Of course the paragraphs should be made where the sense requires it; and also — provided the sense is not disturbed — with a view of the mechanical appearance. But our special point is, that one who "knows how to write for the paper" *will himself indicate* — and distinctly — where the paragraph is to begin. We should say that the frequent failure to do this is stupid, but for the fact that intelligent people are often thus negligent.

(4.) In most newspaper offices a manuscript is often given in parts to different compositors. Therefore but one side of the sheet should be written upon.

(5.) In this age paper is cheap. We hate to see a communication without a title, and with the first line so near the top that the editor, guessing what the proper title is, must get a new sheet on which to write it. Be generous in the use of paper.

(6.) Sometimes a news item, a marriage notice, and a business matter will be crowded in on the same sheet. Then they must be re-written, or else scissors and paste must be put to use in getting them apart. Every separate matter should be written on a separate sheet.

(7.) Finally — for ministers especially — care should be taken in reference to Scripture citations. Absolutely *full half* the references to chapter and verse are erroneous! Further, the quotation is almost certain to contain an omission or other mistake! This statement may seem incredible. But we, who know by much observation, speak by authority.

We might extend this inventory of things which those who "write for the papers" need to know, and knowing need to practise. But for the present let these seven particulars suffice. — *Christian Leader.*

The New Pei-tang Cathedral. — The new cathedral in Pekin, which is to take the place of the Pei-tang, removed two years ago from the neighborhood of the Imperial Palace, after having for many years excited the irritation of the Chinese, is now complete externally, and was consecrated on December 8. Abbé Faires of the Lazarist Society designed the edifice and superintended its construction. The internal decorations remain to be completed and will take several months. The organ is described as a masterpiece of Cavaille de Col of Paris, and the painted windows, which are also fine works, are in their places. The glass, which was brought from France, arrived in Pekin in excellent order. The building is not so large as the granite cathedral in Canton. The total interior length is 248 feet; breadth of transept, 108 feet; breadth of nave, 52 feet; height under the beams, 50 feet; height under the arched roof, 60 feet. The height was fixed in a convention between the Chinese Government and the Lazarist Mission, and one of the conditions imposed was that there should be no tower. These conditions added to the difficulties of the architect, but he is said to have overcome them, and the design is pronounced "noble, harmonious, and beautiful." It is said that the Chinese Government were to send representatives of high rank to take part in the ceremony, "as by the cession of the mission's former site in exchange for the grounds now occupied a troublesome and even dangerous question has been laid finally at rest to the perfect satisfaction of the Imperial Court, the Tsung-li-Yâmen, and Chinese public opinion — the last an important element in the matter — and, on the other hand, to the satisfaction of the Cat holic mission also." — *London Times.*

Sewage Disposal by the Gravitation Siphon System. — A method of sewage purification, depending mainly on aëration, was described by Mr. W. Kaye Parry, M. I. C. E., in a paper read at a recent meeting of the members of the Institution of Civil Engineers of Ireland. The process, which is the invention of Mr. W. H. Hartland, is as follows: the sewage passes from the sewer into a settling-tank situated some feet below the sewer invert. This tank is constructed in the form of a siphon, and the liquid leaving it rises again to the level of the sewer invert. In this tank a separation of the road detritus and other heavy suspended matter takes place, and the effluent, on leaving the tank, contains only the fatty matter of the sewage and the lighter particles that float on its surface. The liquor is now led through a number of vertical filters filled with broken limestone or chalk, and in its passage is deprived of its greasy matter, whilst its acidity is at the same time neutralized by the lime. After this the liquor enters an aëration chamber, where it is broken up into a finely divided spray, which, in falling, comes in contact with a strong current of fresh air, and carries down with it a large quantity of oxygen. It now passes through another settling-tank, of similar design to the former, in which the precipitation caused by the oxidation takes place. The liquor, however, still contains some of the ammoniacal and nitrogenous elements of the sewage, which are recovered by passing it through a second set of filters filled with charred earthy refuse shale or other suitable material. When a high standard of purity is required it is also filtered through peat. In 1887, Mr. Kaye Parry erected an experimental plant for testing the process at Monkstown, Dublin, the sewage being drawn from a sewer draining certain portions of Kingstown. The first settling-tank was constructed to hold 95 gallons, the neutralizing and filtering tank to hold 165 gallons, and the second settling-tank 124 gallons. All these tanks were in duplicate, to permit the cleansing of one set whilst the other was at work. The power for compressing the air was supplied by a 1½ man-power gas-engine, the air pressure adopted being equivalent to 4 inches of water. The first filter was filled with 315 pounds of chalk broken to pass through a 1½-inch ring, and the second with 328 pounds broken to pass through a ½-inch riddle. The other filters contained 5¼ cubic feet of spent shale broken to pass through an 8-inch sieve. In the first set of trials the sewage was passed through at the rate of 1440 gallons a day; this rate, however, it was found advisable to reduce in subsequent experiments to 700, as the sewage was of an exceptionally foul character, containing 158.28 grains of solid matter to the gallon. The trials extended over twenty-five days, and the results obtained were most satisfactory, as samples of the effluent collected in April last are still sweet and free from smell. Experiment showed that 15 grains per gallon of potassium permanganate were required to produce an equivalent degree of oxidation. As the sludge produced during the process is free from chemicals and contains no road detritus, it has exceptional manurial value, analyses showing that 80 per cent of the manurial salts existent in the raw sewage remains in the sludge. — *Engineering.*

TRADE SURVEYS

Most of the business in the hands of architects at this time is for house-building. Most of the work is for houses costing from $5,000 to $20,000. Architects in Boston and New York and Philadelphia and Chicago and other large cities have given it as their opinion that there will be large building operations this year, most of them in the suburbs of the larger cities. They also said that in all probability there will be an unusual amount of work done on the cheaper class of houses for laborers and persons of small means. Real estate agents, particularly throughout the West, corroborate these statements and say that their sales of real estate this winter have been much larger than last and far ahead of any season for years past for building purposes especially. A careful consultation of the real estate sales in all our larger cities proves this to be correct. Large plots of land have been selling all winter in New York City for building purposes. Larger transactions have been reported in Philadelphia than for years. The same is true of Pittsburgh, Duluth and other Western Cities. The improving demand for real estate is not of a speculative character. Builders and others have observed that real estate in our larger cities is steadily improving and they have been simply buying sites for building purposes in order to protect themselves against a speculative advance which influences now at work are gradually bringing about. In Chicago it is stated on very high authority that there is an improving demand for desirable sites in both the city and suburban places for house-building purposes and for factory use. There is a considerable increase in the demand for sites throughout the larger cities of Indiana and Ohio, and influences there are working to develop industrial growth, one of which is cheaper coal and to some extent cheaper fuel. Schemes are under consideration which will probably result in the supplying of small manufacturers in the Northern towns of these States with natural gas at a price one-third less than that of coal. Some estimates put the figures at less.

The Standard Oil Company is securing the control of the entire natural-gas region of Ohio, and it will consequently be supposed that natural-gas will be sold at the highest price the traffic will bear. The industrial towns and cities of these three States are growing more rapidly than in any other part of the country. Part of this growth is due to the industrial development throughout the South, where the products of these States are finding increasing sale. The stimulus is also largely due to the filling-up of the Northwest, of which Chicago is the base of supplies. Then these three States are growing in population and wealth very rapidly, with the Lakes on one side, and the Mississippi River bounding them on the west and south. It must be noted, however, that farm-lands in these States are not improving in value, but in many cases declining. Cereal products can be purchased cheaper in the West than they can be grown there, and hence real estate is to be had at prices which are favorable to purchasers for manufacturing purposes. The cities of the Ohio Valley are generally increasing in population and wealth. New iron and steel companies are being organized, and oil-producing companies are also operating there. There are schemes for the laying of several hundred miles of pipe. Railroad companies have their plans completed for the laying of their tracks on both sides of the Ohio, and smaller manufacturers by the hundred are thriving in their little circles from the general activity within and without this region. Throughout the entire West there are growing evidences of an increasing activity in building operations, in mining, in railroad-building, in ship and boat building. The West is becoming gradually more and more financially independent of the East, although a great deal of money is still floating in that direction. The Western States are gradually becoming financial centres within themselves. There is a transfer of capital gradually going forward because of the increasing security of loans and the generally satisfactory rewards secured. Among the prosperous industries of the West are to be noted the paper-makers of Wisconsin, where, within two years past, capital has been more than doubled. New paper-making enterprises are springing up, stimulated by the abundant supply of facilities. Besides this, the demands for paper-making are increasing rapidly, and the freights to markets are much lower than from the Eastern sources of supply.

The lumber trade of Michigan and Wisconsin is good although the increasing supply of lumber from Arkansas, Louisiana and Mississippi is threatening the supremacy of white pine especially in the far Western markets. The demand for Southern lumber products is increasing much more rapidly than Northern. The rates from Southern points are low. The cost of stumpage only a fraction of what it is in Michigan. The facilities for transporting lumber are being improved and it is only a question to experts in the lumber trade, when those who control the Southern interests will control the lumber interests of the entire country. The fancy grades of hard wood are growing in demand throughout the West and speculation is going on in choice Southern lumber territory. The iron and steel makers are still complaining of a backward tendency in the spring demand. Railroad builders are creeping along slowly, prices are steadily declining, two dollars per ton has taken place on steel rails. A Pig-iron Association has been formed with a capital of $2,000,000 which will deal in warrants. Each warrant represents 100 tons which can be used as collateral in commercial transactions. This will probably result in the steadying of the iron market throughout the country and in the carrying of larger stocks as is done in Great Britain. The combination is composed of some of the leading financiers, manufacturers and iron dealers. It has a backing which insures it a success and the trade conditions call for just such a movement. The charges will be about fifty cents per ton per year for iron, and production will be kept under conservative control.

S. J. Parkhill & Co., Printers, Boston.

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Competitive Drawings for
Proposed New
World Building

R. H. Robertson Archt
121 East 25th St. N.Y.

Heliotype Printing Co. Boston

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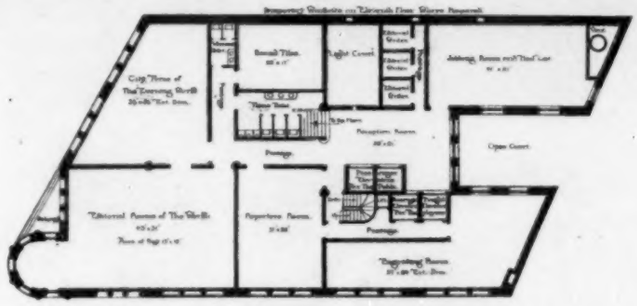
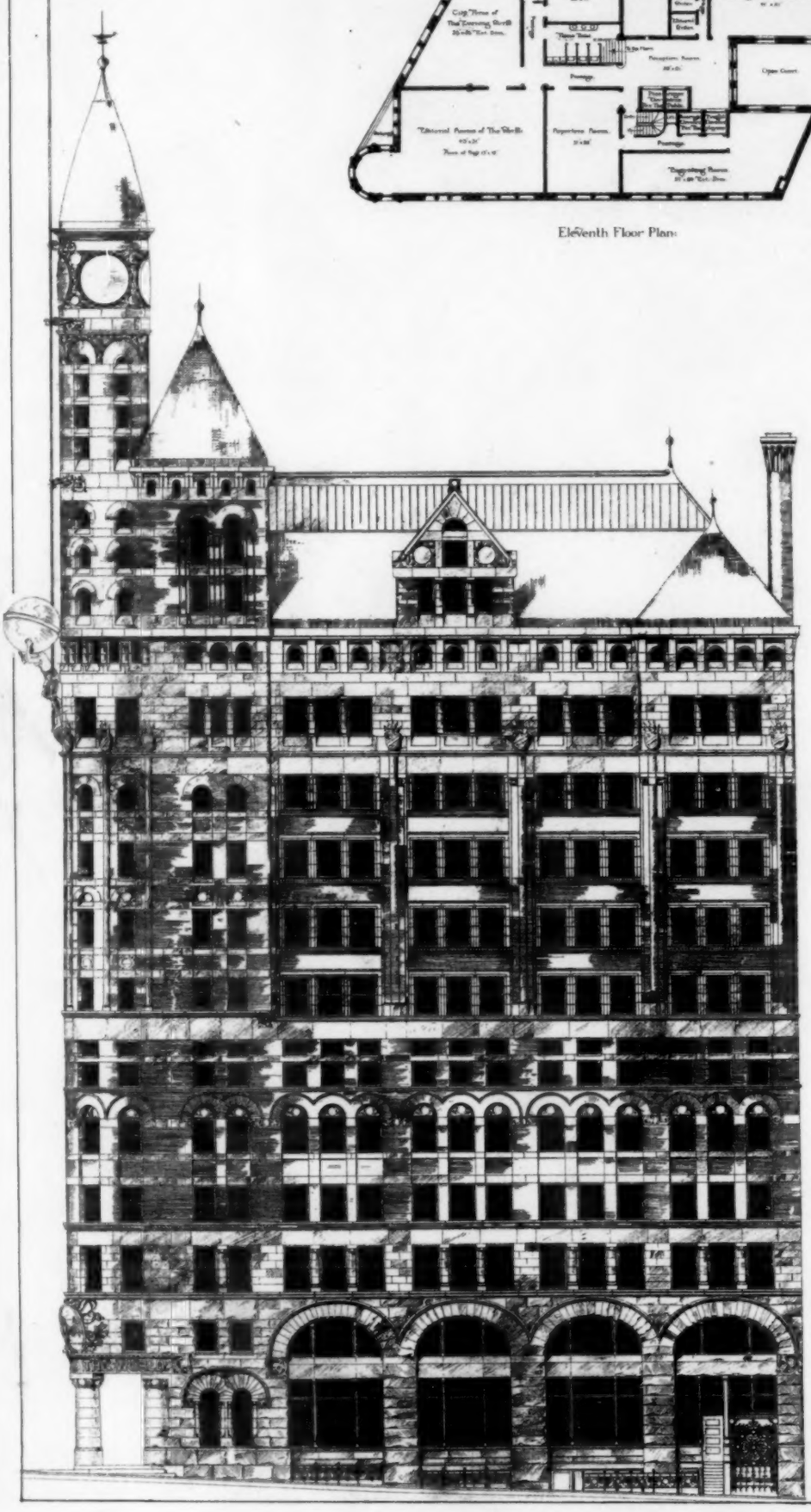


Eleventh Floor Plan.

Competitive Drawings
Proposed New
World Building.
H. Robe



Elevation on Frankfort Street.

Scale - 1/8 in. = 1 Foot.

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Drawings for
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H. Robertson Arch.
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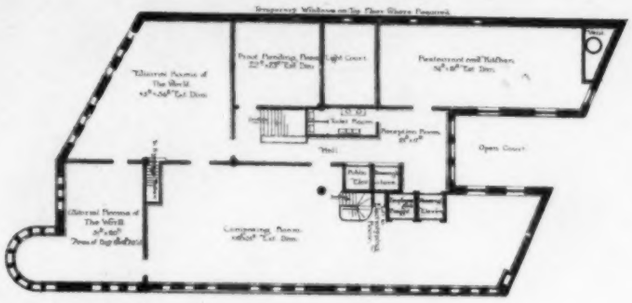
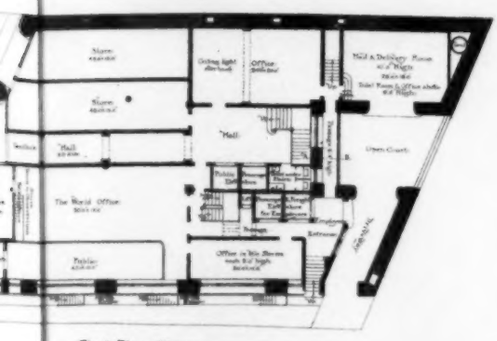
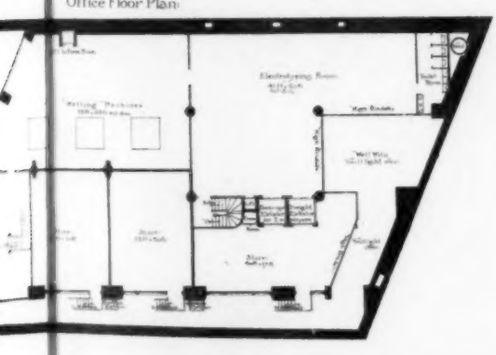


Top Floor Plan

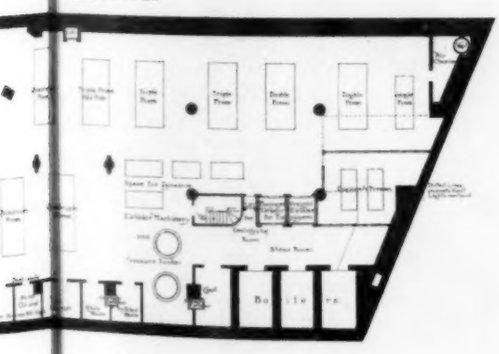


First Floor Plan.

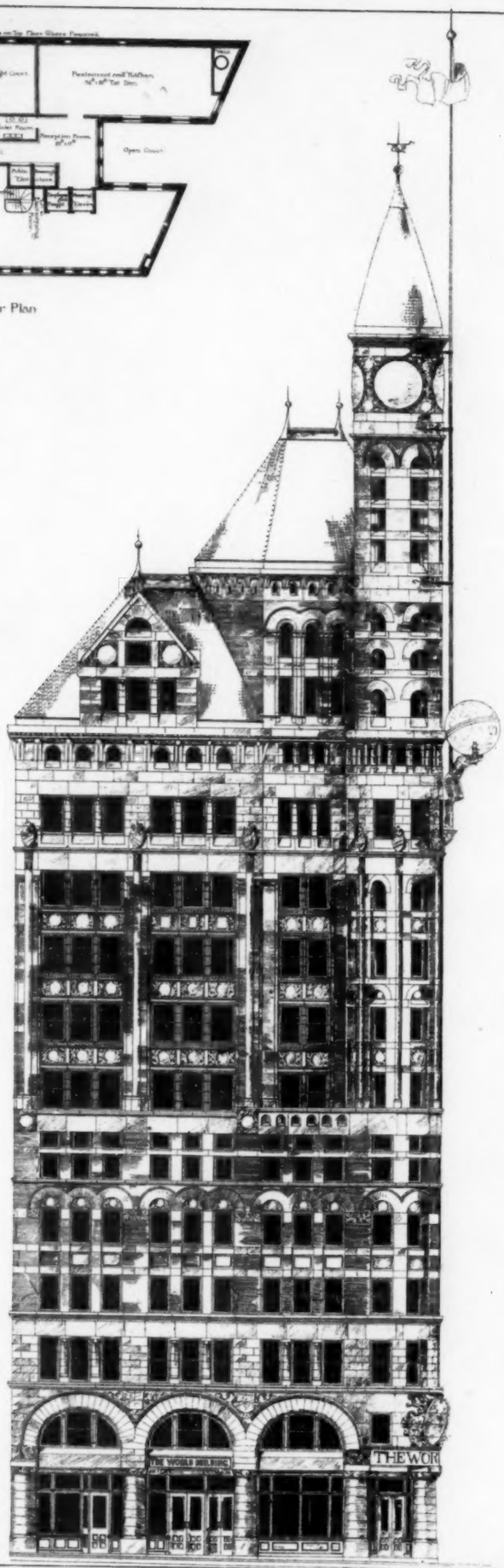
Office Floor Plan.



Basement Plan.



Sub Basement Plan.



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Elevation on Chatham Street.

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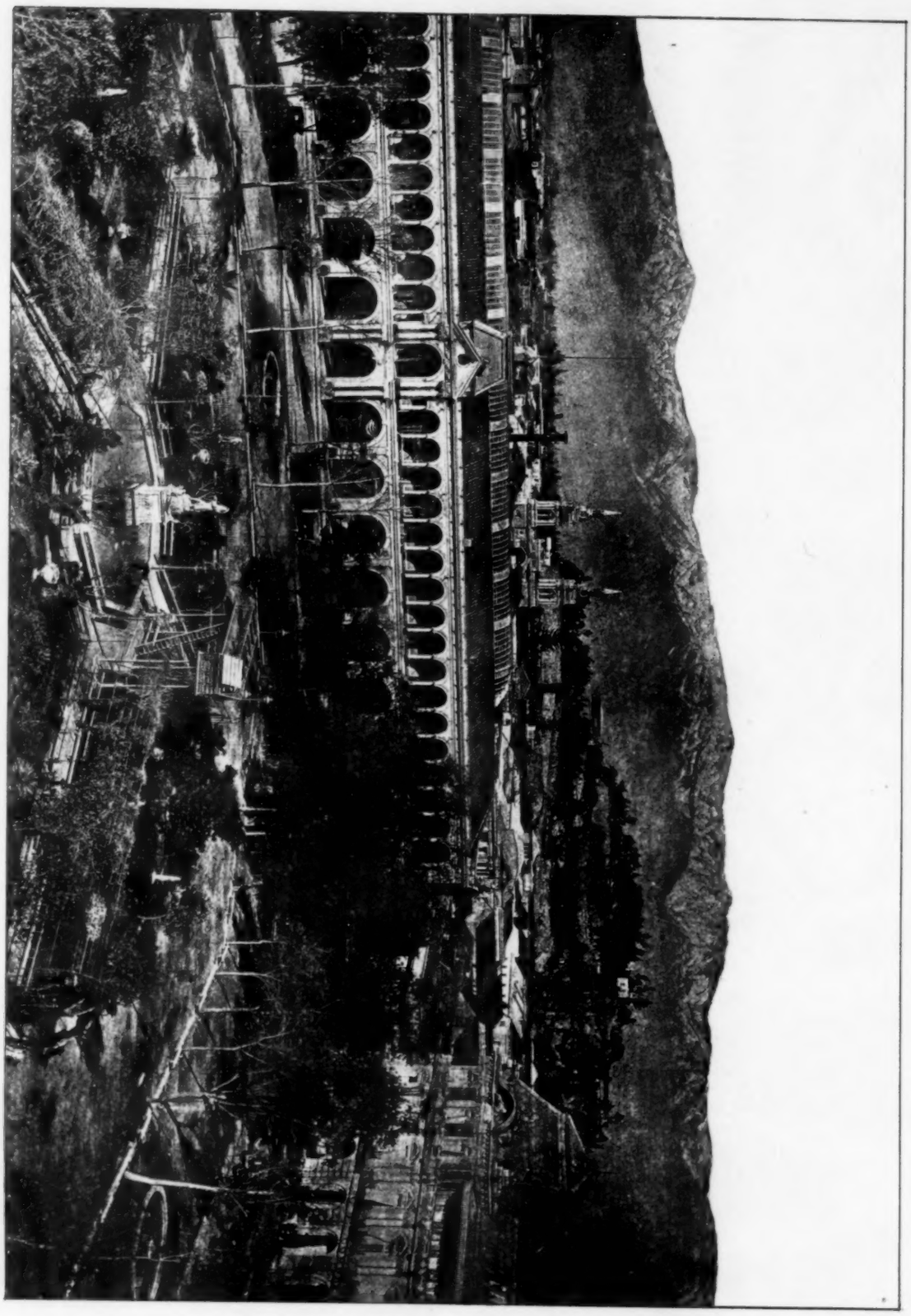

—THE PLACE OF ARMS, SANTIAGO, CHILI.—

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American Architect and Building News, Feb. 9, 1889. No. 655

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